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HISTORICAL STUDIES

BY

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HISTORICAL STUDIES

EGYPTIAN FESTIVALS AND NILE SHRINES.

By W. M. FLINDERS PETRIE.

1. THE great Harris papyrus, which recapitulates all the offerings of Rameses III, has only gradually been appreciated. At first the historical portions were the only pages regarded. Then the statistical value of its records of endowments, in men and land and metals, were studied; but the hundreds of entries, with very various numbers, of all kinds of material, have scarcely been touched. Here we purpose to shew some of the results which can be drawn from the lists, bearing on the festivals and the organization.

The Composition of the Numbers. It has long been noticed that in sections which refer to offerings extending over the whole reign, of 31 years, the number 31 and its multiples often recur. That is to say the total is made up of a fixed number of offerings made each year. In another part where offerings during 23 years are summed up (pl. 34*b*) the numbers are all multiples of 23. This analysis can be carried much further; in one of the fullest sections (17 to 21) it is stated that the offerings were made on a festival of 20 days during 11 years, and on a festival of 27 days during 31 years. The total number of festal days was thus 220 and 837. Now the first entry is of 1057 loaves; and this is 220 + 837, or one loaf on each feast day. The next entry is 1277, which is the same with 220 added, 837 + twice 220. These suffice to shew that the numbers should be analysed into multiples of 11, 31, 220, and 837; that is to say certain amounts offered on the great day of the feasts, and on each day of the feasts. To illustrate how these high numbers were piled up, take the following examples:—

	Totals	11 ×	220 ×	31 ×	837 ×
Lotus, for the hand	144,720	2000	400	40	40
Dates, measures of	65,480	500	50	500	40

It will be noticed that the lotus was far more commonly used in the 11-year festival than in the 31-year festival. The reason of this is that the 11-year festival was held from 26 Pakhons to 15 Pauni, or 6th to 26th of March (at the end of the reign, and 7 days later at the beginning); while the 31-year festival was held 19 Paophi to 15 Hathor, or 1st to 27th of August. Now in March the lotus abounds in the canals, while in August the inundation flooded the country so that lotus could only be got from gardens. The dried dates, on the contrary, were equally served out to the populace at both seasons, 500 measures a day on the great day of both March and August feasts, and 50 or 40 measures during each day of the feasts. These examples will serve to shew how the numbers may be studied, and to explain the method by which the following view is reached. The actual analysis of all the numbers is given in the tables at the end, pls. i, ii. A few differences from Prof. Breasted's translation will be found justified by his corrections in *Amer. Jour. Sem. Lang.* 1910.

2. *The Temple Provision.* The dressing of the festival hall in the March feast was with 100 bundles of tamarisk branches, 100 bundles of reed-grass, 1000 bunches of green corn, 50 great bouquets such as we see represented on stands, 100 measures of *isi*-plant and 360 measures of it fresh each day, 10 lotus bouquets along with 15 more bouquets daily, with 10 measures of flax. The hall must have been bowered with greenery and bright with flowers.

The offerings were *hotep* tables set out with bread, meat, and *rahusu* cakes, 15 of which were offered on the great day, with 30 more similar *hoteps* "of gold," probably gilded baskets containing the offerings. With these were offered 40 large oblation loaves on the great day, and 30 more daily. Of special kinds

of loaves there were 1 large loaf and 2 *sad*, 2 *beh*, and 2 *sedmet* loaves each day. There were 20 jars of incense provided for the festival and 20 bundles of papyrus "of the house of incense," probably used to light the incense in the censer. There were 4 pottery jars provided on the first day, and 6 more each day. The frequent mention of *rahusu* cakes with bread and meat, suggested that they were dough cakes boiled with the meat; *rakhash* (Heb.), boiling, might possibly refer to light puff bread, but that would be less likely to be eaten with meat.

3. *The Priesthood and Nobles.* The priesthood seems to have been 120 in number. This is shewn by the number of papyrus sandals provided, 360 in the March feast, 360 in the August feast, and 120 leather sandals in August. These numbers would imply for each priest one pair of leather sandals yearly, and papyrus sandals every two months. Perhaps there were only 60 priests, and the sandals lasted half the time; but from leather sandals only being given at one feast, it is more probable that they were only one pair a year. These numbers serve to indicate that offerings which were multiples of 3 were probably for the use of the priests. There are 12 special dresses, 4 coloured tunics and 8 of thick stuff, probably for the chief priests. Dishes of bread, meat, and *rahusu* cakes were provided, 30 on the great day, and 20 daily in the feast. Also special bread of divine offerings was offered in 30 gold dishes, 600 *baat* loaves on the great day and 150 daily, 15 *persen* loaves and 300 daily, 20 white loaves and 30 daily, 360 loaves daily of *kunek* bread, and 15 loaves "of the fire," with 75 such daily. 5 hins of oil daily, and of strong beer, 18 jars on the great day and 6 jars daily, seem to have completed the priestly provision.

The nobles and great people attending the feast seem to have numbered 100, probably divided into 20 groups. We see *isi*-plants for the hand, 100 on the great day and 150 daily; dishes of bread, meat, and *rahusu*, 20 on the great day and 50 daily; loaves of grain double of these quantities, 40 and 100. Jars of fish, 40 for the whole feast; *rahusu* cakes, 20 measures; wine, 20 jars and 25 daily; cinnamon, 20 portions; grapes, 5 measures.

4. *The Populace.* The populace attending the feast seems to have been reckoned at 10,000. This is a very moderate number, as the great fair of Tantah is twenty times as large. There were 10,000 bouquets of flowers for the great day, and 4000 daily also, with an equal number of bouquets for offering, the worshipper apparently taking two bouquets, one for himself and the other to offer. Similarly 20,000 white loaves were provided for the great day, and 1600 such daily. Of other kinds of bread there were 1000 *kolusta* and 1000 *pat* on the great day, and also daily; 200 measures of cakes on the great day, and 10 daily. Other kinds only provided daily were 250 great loaves, 100 *udenunt*, 100 *apt* of *rahusu*, and 10 jars of meal. Of beer there were 125 jars on the great day and 900 daily. The reason for the short amount extra on the great day, is that 60 jars of the strongest drink were then provided, *shedeh* wine, kept until it had developed a large amount of alcohol. 500 hins of oil were supplied daily. Of fruit there were 1000 measures on the great day, and 250 measures daily; of dried figs for the great day, 100 weights and 5 measures, probably a large amount, with 4 *heqt* of southern fruit; and 500 measures of *an* fruit every day, with 25 of southern fruit. 500 measures of dates on the great day and 50 daily completed the fruit supply. (If, however, the reading 78,550 be correct, that would transfer the fruit to the August festival, instead of 1000 measures here.)

Meat was provided in small quantities: 20 oxen, 25 cows, and 1 gazelle; 100 live birds, 100 *turpu* geese, 200 hatching fowl, 20 waterfowl, and 8 cranes, for the whole festival; while 50 pigeons were killed daily. Of fish there were 6000 on the great day and 1000 daily, with also 200 white fish. With these were 25 large measures of salt on the great day and 100 cakes, with 70 cakes of salt daily; similarly 100 and 70 cakes of natron. 1400 bundles of vegetables on the great day, and also 500 a day, completed the food supply.

The people were provided on the great day with 2000 lotus flowers for the hand and 2000 stems of papyrus, and each day with 400 lotus and 500 papyrus stems, and 500 lotus bouquets. Of papyrus bouquets there were 200 at the opening and 300 daily as well.

5. *The August Feast.* We next turn to the August feast of 27 days. The numbers attending the feast seem to have been about half of those at the March feast. There were 4800 instead of 10,000 bouquets of flowers for the great day, 1000 instead of 4000 daily. There were 10,000 instead of 20,000 great loaves, and 750 instead of 1000 daily. The decoration of the hall was like that in March, only with more flowers. 70 bundles of tamarisk and 100 bundles of reed-grass made the

background. 4 screens of flowers, 100 bouquets, 500 nosegays, 400 chains of blue flowers, and 20 strings of flowers, were the decoration of the great day of the feast. Beside these there were 600 garlands on the great day and 50 daily, 60 great bouquets on the great day and 20 daily, and 125 *apt* measures of *isi*-plant on the great day, and 48 measures daily. Flowers were far more abundant in August than in March.

The offerings were daily one of each of the three kinds of loaves, and of the great loaves 100 on the great day and 40 each day. 20 jars of incense were provided, 18 ordinary and 2 of white incense, and with this were 15 bundles of papyrus for burning the incense. There was also a large quantity of inferior incense, the numbers of which cannot be separated. Of bread, meat, and *rahusu* cakes there were 5 *hotep* tables.

6. *The Priesthood and Nobles.* The priesthood probably numbered 120 as we have noticed ; receiving in this feast 120 leather sandals, and 360 papyrus sandals. They fed upon 30 *hotep* tables of bread, meat, and *rahusu* cakes, 1200 *kunek* loaves, 30 jars of meal, 200 great loaves, 800 sweet loaves, and 100 *mehint* cakes, on the great day. Of other bread there were 200 *baat* loaves and 20 *persen* loaves on the great day, and 20 and 48 of these daily. 12 jars of strong beer on the great day and 3 daily. Also there were provided 3 hins of sweet oil, 3 of plain oil, 1 of red oil, 10 jars of honey, 3 jars of olives, 2 jars of white fat, 10 *apt* measures of figs, and 5 measures of cinnamon. Of course these supplies provided not only for the priests, but for their numerous families.

The nobles had 12 tables of meat, bread, and *rahusu*, for the great day, and 4 a day as well. With each table were 2 loaves of grain, 24 and 8 daily. Also four measures of *rahusu* cakes each day. 10 jars of strong *shedeh* wine were provided. Of fruit there were 10 weights of figs, 50 baskets of *semu*, 2 measures of grapes, 10 jars of olives. Of S. fruit 3 large measures, and 4 daily. Of *khithana* 10 large measures, and of cabbage 20 large measures. 50 pottery jars were used in the feast, and 8 daily as well. The 40 lotus flowers for the hand, with 40 on each day, were also for the nobles. The meat supply for the feast was rather more than for the March festival: 50 oxen, and daily 1 cow; 4 gazelles; 4 geese, and 8 each day; 10 large birds, 14 *turpu* geese, 2 cranes, 60 hatching-fowl, 800 waterfowl, 700 quail, 160 pigeons and 50 each day, 40 *sesha* birds, and 48 doves with 6 each day. Of fish there were 500 dressed fish, and 500 split fish.

7. *The Populace.* The populace was well provided, apparently about 5000 being present on the great day, and a few hundreds all through the feast. Of bread there were 10,000 great loaves on the main day, and 750 daily; 1500 pyramidal loaves; 1400 *kolusta* and 200 daily; 700 *udenunt* and 100 daily; 1000 *pat* loaves; of *rahusu* cakes 200 measures, and of other cakes 50 measures on the great day and 50 daily. The drinks were 50 jars of the strong *shedeh* wine; 10 of ordinary wine and 40 daily; 100 jars of beer and 20 daily. Of fruit we find 240 measures and 30 each day (or, if the reading be 78,550, then 90 on the great day and 80 each day); also of other fruit 20 sacks and 20 measures. *An* fruit 1000 measures and 500 each day. Figs 500 measures. Grapes 70 measures of different kinds. Dum palm nuts were then in season and 1000 *apt* were provided, with 500 on each day. Of pomegranates 500 *apt* and 40 crates. 30 *apt* of a fruit called *nebdu*. 500 measures of dates on the great day and 40 each day; with 100 whole bunches of dates. Of vegetables 10,000 bundles on the great day, and 400 each day, beside 70 measures, were provided. Of *khithana*, which is unknown, there were 200 bunches.

The worshippers had 4800 bouquets of flowers at first, and 1000 each day, beside the same numbers to offer. 1500 flowers for the hand and 1000 ears of corn for the hand. There were also on the great day 1000 papyrus stems and 350 *isi*-plants for the hand, with 200 and 100 respectively on each day of the feast. Of coarse salt there were 40 large measures, and of fine salt 80 cakes on the great day and 60 daily; while of natron there were 280 cakes and 60 daily. The use of 100 *deben*, or 20 lbs., of wax is not clear; possibly it was for candles before the shrine.

We have now reached the basis of a picture of a great festival,—the decoration of the hall with branches and flowers, the flowers carried by every worshipper and offered by each, the feasts provided for the priesthood, the nobles, and some 5000 or 10,000 of the people. There was a far larger attendance on the great day of the feast than subsequently.

8. *Other Sections.* Another section of the papyrus recounts the offerings to Amen during 31 years (13*a* to 16*b*). Here the multiples are of 31 in most cases, so that we have the following amounts for each year: silver rings 10, amulet cords 5, carnelian *uza* eyes 6, lazuli *uza* eyes 7, jasper scarabs 2, lazuli

scarabs 2, pendent seals 2, crystal seals 50, crystal beads 500, crystal vases 5, wooden seal 1. Of many things the offerings are slightly irregular, working out as even numbers if between 30 and 31 years. Thus there were annually 70 jars of white incense, 35 jars of honey, 90 of Egyptian oil, 60 of Syrian oil, 30 of white fat, 12½ of goose fat, 8 measures of cinnamon, 4 measures of *nukapatha*, 60 crates and measures of grapes, 12 crates of pomegranates. Other things were provided more frequently, as 8 geese and 14 *turpu* geese each month, and two jars of *shedeh* or wine every day.

The section on the new feasts founded in the 9th year, and lasting 23 years to the king's death, has numbers which are divisible by 23. One exception is the measures of beer, which are 24 daily during the time.

9. *The Nile Offerings.* The "Books of Hapi," the Nile god, are the next division (37*b* to 41*b*). The heading states that the offerings were founded by Rameses, "the increase of 8 years making 31 years"; that is, the greater amount of offerings during years 1 to 8, making with the subsequent 23 years the whole 31 years of the reign. Prof. Breasted prefers to read 48 years making 31 years, and considers the sentence quite insoluble; but Birch read "*aa*" (increase), not "40"; and the sign *aa* appears in almost this form in page 17*b*, line 11. It is quite likely that the first draft may have been *aa*, and owing to a number following it the scribe thought it was 40 and wrote accordingly. We find that eight years is a factor in all the numbers, which points to the intelligible reading above. We see ten multiples of about 2920 (from 2909 to 2945 in different subjects). Now 2920 is the number of days in eight years. Another very frequent base is 848, of which there are 53 examples, with various multipliers. Taking eight years, as stated, and shewn by the number of days, this yields 106 per year. What then can 106 be, as a basis of offerings to Hapi, and particularly of statuettes of Hapi?

10. *The Nile Stages.* The Nile was divided into a series of towing stages, called schoinoi, though longer than the land schoinos. The length of these stages is best fixed by those beyond Egypt in the dodeka schoinos from Aswan to Takompso. This district was about 81 miles along the river, giving 6·74 miles per schoinos, or 5·92 miles if measured direct upon the plain. This river schoinos is stated by Herodotos to be 60 stadia, or 6·9 miles. Probably it was 20,600 cubits, or 6·55 miles. On this scale of the schoinos the distance from Aswan to Memphis would be 84 schoinoi, and from Memphis to the sea 21 on the plain or 27 by the river windings. Thus the number of these stages on the Nile was between 105 and 111. This small uncertainty thus includes the number 106 which is so prominent in these Nile offerings.

Herodotos gives the same number, in stating that the schoinos was 60 stadia. The distance from the sea by river to Syene is 725 miles, or 6330 Greek stadia. This divided by 60 is 105½ schoinoi. His statement of the number of schoinoi is apparently corrupt, as he gives from the sea to Heliopolis as 25, and from Heliopolis to Thebes as 81, making 106 from the sea to Thebes. He then adds 30 from Thebes to Elephantine. It is possible, however, that the schoinos varied (see Strabo, XVII. i. 24 for later variations), and that the 106 which we here deal with were the Nile stages only from Thebes down to the sea.

11. *The Nile Shrines.* The conclusion then is that the 106 offerings were made for, or at, each stage on the Nile; and as they are mainly of statuettes it is probable that each stage had a shrine of Hapi on the shore, and these shrines were redecorated each year. There is also another important number, the 272 "Books of Hapi" recording the offerings. These divided by the 8 years shewn by the offerings gives 34 a year: and 34 has no relation to the 106, which we have seen to be the stages on the Nile. But the Nile flows through 22 nomes in Upper Egypt, and in Lower Egypt its main stream touched 12 more nomes—Memphis, Letopolis, Heliopolis, Athribis, Prosopis, Bubastis, Busiris, Sebennytus, Xois, Mendes, Hermopolis, and Pakhnamunis. Thus there were 34 nomes on the course of the Nile, and there may have been a register of the offerings in each nome on the Nile.

The numbers then shew the amounts provided daily in the great shrine of Hapi. There were 160 *baat* loaves for divine offerings, 300 *persen* loaves, 16 *kunek* loaves, 17 jars of beer, 21 large measures of grain, 1 cow or ox, 2½ jars of *shedeh* or wine, 30 jars of incense, 15 measures of palm fibre, 15 flower garlands, and 25 bunches of grapes or raisins. These were used at the great temple of Hapi, and perhaps partly at the lesser shrines.

The river shrines at each stage had each year 12 kilts of linen for the keeper or the priest, 300 measures of fruit, 125 *apt* of raisins and of carob-pods, 15 measures of onions, 15 jars of salt and of natron,

14 measures of dried dates, berries, *senb* berries, and raisins, 5 jars of white fruit, 1 basket of apples, 14 bundles of herbs, and 1 jar of best oil. For the decoration of the shrine there were 135 bouquets of flowers, and a like number for personal use, 125 bouquets of "garden fragrance," 84 bunches of cyperus, 10 *isi*-plants for the hand, and 1 measure of the same. The sacred figures were renewed yearly, 6 sycomore figures of Hapi, and 6 of the female Hapi; 8 figures of Hapi in gold, silver, iron, copper, lead, tin, *menituz*, *minu*, *shesmet*, green felspar, alabaster, red jasper, carnelian, *kenmat*, *mesdemt*, *seher*, *tur*, and bronze; and 16 figures in turquoise or malachite, lazuli, and various precious stones. There were also 12 crystal seals, 12 bracelets, and 12 armlets.

12. *The Nusa Weight.* The statement about all these figures is "*nusa* 6784," or other number. This is explained in more detail in 55*a*, where there is an entry of each material, "statues 656, nusa 656," shewing that the figures weighed a *nusa* each. There is a mention of a weight of lead in the annals of Thothmes being 1200 *nusa*; but we have no proof of the origin or amount of this weight. There is one suggestion to be made. On a trilingual weight (*S. B. A.* x, 464) there is a statement in Susian that it was 2 *nosham* 1 *u*; as it weighs 2573 grains, that shews the *nosham* to be 1225 grains. This is an eighth of 9800 grains, the mina of the gold standard of 196 grains; and in Syria this standard is 198·5. Thus the *nusa* used for precious metals might be produced by successive halvings of the mina of the old gold standard. Yet it seems unlikely that 140 lbs. of each of these precious materials was dedicated to Hapi every year. The metals might only be plated, but the double amounts of lazuli and turquoise could hardly be as much.

13. *The Stages in Upper Egypt.* Another section about Hapi is 54*a*–56*a*, which contains the offerings of the Books of Hapi from year 29 to year 31, 3 years. The notable fact is that nearly all the entries are multiples of 41. One possibility is that these were monthly offerings, and that the whole period was 41 months, 3 years and 5 months. But as these offerings began in the 29th year, and Rameses died on the 40th day of the 31st year, it is impossible to get 41 months in to the allotted dates. Again, it would be unlikely that fresh statuettes of Hapi would be dedicated every month. The only other possibility is that this common basis is 82, and that this was the number of Nile stages in Upper Egypt; we have already reached 84 as the number by the schoinos measure, and Herodotos states 81 stages from Heliopolis to Thebes, so it might easily be this number, 82. If so we must regard these endowments as additional for the Nile stages of Upper Egypt.

The offerings for each of the 82 stages, once for all, are: cattle 5; birds 50; wine 10 jars; incense, censers 2, measures 1; oil 2 jars and 7 jars; cinnamon 7 sticks; gold statuettes of Hapi 8, silver 8; white fat 2½ hins, 14 jars; fine fruit 280 jars; fruit 550 jars; raisins 256 *apt*; carobs 256 *apt*; cyperus for the hand 175; pomegranates 256 *apt*; "garden fragrance" 256 *apt*; *isi*-plants for the hand 20; blossoms bouquets 256 and offerings 256.

The offerings which were renewed every year were: bread, 300 *baat* loaves, 60 cakes, 25 pyramidal loaves (these probably provided a loaf a day at every stage shrine for the priest); wine 96 jars; onions 96 measures; salt 96 measures; figures of Hapi, of stone 64, of sycomore wood 4, and 4 of the female Hapi; crystal bracelets and seals 12 each; kilts of linen 12; honey 14 jars; flower garlands 12.

The two sets of numbers, divided by 8×106 for 8 years of all the stages, and by 3×82 for 3 years of the Upper Egypt stages, yield in each case 12 kilts for the priest, and the figures of Hapi are 8 of each material, while the crystal ornaments are 12 of each. This similarity of the numbers is evidence that we have rightly divided them by these years and by the number of stages.

We get then the idea that at every 6 or 7 miles along the Nile stood a little shrine, with a priest, endowed with a small provision, to provide for the honouring of Hapi by passing travellers. The little shrine was decked with flowers, and had statuettes of Hapi in all kinds of materials. Probably the images were all thrown into the river as sacrifices, when the new figures were distributed each year.

The next section is that of the tribute of Rameses to the gods during 31 years. This is evidently made up of two lists: one covering a little over 31 years, the basis of the numbers varying from 30·95 to 31·39; the other covering 28½ years, the basis varying from 28 to 28·75. We have no historical explanation for these latter figures.

We have now traced some of the results given by the numbers of these offerings; more may, no doubt, yet be done, but the present analysis has enabled us to restore a view of the great festivals, with the priesthood, nobles, and populace attending

them, and has indicated the division of the Nile course into stages, with wayside shrines of Hapi at each stage. The details of the numbers and their division will be found on pls. i, ii.

THE HELIACAL RISING OF SIRIUS.

By E. B. KNOBEL.

14. *The Length of the Sothis Period.* Much research has been made into the origin of Egyptian chronology and its connexion with the heliacal rising of Sirius, but it was not until the publication by the late Professor Oppolzer of his memoir "Ueber die Länge des Siriusjahrs und der Sothisperiode," in the 90th volume of the *Sitzungsberichte* of the Vienna Academy, that the question was put upon a sound basis. Starting with the well-determined observation of A.D. + 139, reported by Censorinus, Oppolzer calculates the length of the Sirius year and thence the Sirius period, which is the interval between two successive Sothic risings coincident with the 1st Thoth. He shews that the Sirius period is of irregular length, and gives the following series of Julian years as those commencing Sothis periods :—

Sothis Period.	Julian Years.	Interval. Julian Years.	Egyptian Years.
Zero period	A.D. −4235		
		1460	1461
1 „	−2775		
		1458	1459
2 „	−1317		
		1456	1457
3 „	+ 139		
		1452	1453
4 „	+1591		
		1448	1449
5 „	+3039		

Recent discoveries necessitate the calculations being carried further back, particularly for the purpose of determining the seasonal changes in the commencement of the Sothis period. Two periods beyond Oppolzer's zero period have therefore been computed by the formulae given on p. 577 of his memoir. These are the years A.D. − 5705 and − 7171. As Oppolzer designated the period commencing A.D. − 4235 by zero, the two more remote epochs are called − 1 and − 2 periods.

		Interval. Julian Years.	Egyptian Years.
−2 period	A.D. −7171		
		1466	1467
−1 „	−5705		
		1470	1471
Zero „	−4235		

15. *The Material of the Table.* The following table gives particulars of the heliacal rising of Sirius for the commencing years of six Sothis periods, including, at the request of Professor Flinders Petrie, four other years.

The table may be thus explained :—

Column 1 gives the series of years from A.D. −7171 to + 139.

Column 2 shews the ordinal number of the Sothis period adopted by Oppolzer.

Column 3 gives the corresponding years of the Julian period, the years before the commencement of the Julian period, A.D. − 4712, being indicated by the negative sign.

Columns 4 and 5 give the approximate right ascension and declination of Sirius for the above years. These positions are derived from the tables given by Dr. Danckwortt in the *Vierteljahrschrift* of the Astronomische Gesellschaft, vol. 16 (1881). Danckwortt computed the places of certain stars, with the most recent determination of their proper motions, for epochs as far back as the year A.D. − 2000. From his right ascension and declination of Sirius reduced to longitude and latitude, constants were obtained for determining the longitude and latitude at the remote epochs under consideration, and with the values of the obliquity of the ecliptic computed from the formula

$$23^{\circ}\ 27'\ 31''{\cdot}83 - 0''{\cdot}47593\,(t-1850) - 0''{\cdot}00000143\,(t-1850)^2 + 0''{\cdot}00000000204\,(t-1850)^3$$

the approximate right ascensions and declinations in the table were obtained. The earliest year, A.D. −7171, is somewhat close to the epoch of maximum obliquity of the ecliptic for which the above formula would have to be modified, but any error from that source would be insensible for the purposes of the present discussion.

Column 6 gives the sun's longitude on the day of the heliacal rising of Sirius. The depression of the sun below the horizon at the Sothic rising is taken from Oppolzer as 10° 48′, and the calculations are made for the latitude of Memphis taken as 30° N.

The following formula was employed :—

α = Right ascension of Sirius.
δ = Declination of Sirius.
ϵ = Obliquity of the ecliptic.
T = Sidereal time of the star rising.
$\odot$ = Sun's longitude at Sothic rising.

Then

$$\cos(\alpha - T) = \tan\delta \tan 30°,$$

whence the value of T.

Then

$$\cos(90 + 10° 48') = \sin 30° \sin\epsilon \sin\odot + \cos 30° \sin T \cos\epsilon \sin\odot + \cos 30° \cos T \cos\odot,$$

whence $\odot$ the sun's longitude is obtained.

Column 7 gives the day of the Julian period of the Sothic rising calculated with the assistance of Schram's "Hilfstafeln für Chronologie" in vol. 45 of the *Denkschriften* of the Vienna Academy, the days before the commencement of the Julian period, A.D. – 4712, being indicated by the negative sign.

Column 8 gives the corresponding date in the Julian calendar.

Column 9 gives the day of the Julian period of the 1st Thoth calculated by multiples of 365 from the day of the observation of Censorinus, July 20 A.D. + 139, as determined by Oppolzer.

Column 10 gives the corresponding date in the Julian calendar.

16. *Table of Sothis and 1st Thoth.*

Year A.D.	Sothis Periods.	Year, Julian Period.	Sirius.		Sothic Rising.			1st Thoth.	
			R.A.	Decl.	Sun's Longitude.	Day of Julian Period.	Day of Julian Calendar.	Day of Julian Period.	Day of Julian Calendar.
– 7171	– 2	– 2458	359° 36′	– 42° 42′	61° 5′	– 897,948	July 21	– 897,947	July 22
– 5900		– 1187	14° 46′	– 35° 58′	69° 38′	– 433,716	„ 20	– 433,667	Sept. 7
– 5705	– 1	– 992	17° 1′	– 34° 57′	71° 0′	– 362,491	„ 21	– 362,492	July 20
– 4400		+ 313	31° 29′	– 28° 31′	80° 4′	+ 114,158	„ 17	+ 114,198	Aug. 26
– 4235	Zero	+ 478	33° 16′	– 27° 46′	81° 14′	+ 174,424	„ 18	+ 174,423	July 17
– 2900		+ 1813	47° 41′	– 22° 20′	90° 55′	+ 662,032	„ 18	+ 662,063	Aug. 18
– 2775	+ 1	+ 1938	49° 3′	– 21° 56′	91° 53′	+ 707,689	„ 18	+ 707,688	July 17
– 1400		+ 3313	63° 56′	– 18° 1′	102° 33′	+ 1,209,908	„ 18	+ 1,209,928	Aug. 7
– 1317	+ 2	+ 3396	64° 50′	– 17° 51′	103° 13′	+ 1,240,223	„ 18	+ 1,240,223	July 18
+ 139	+ 3	+ 4852	80° 46′	– 15° 53′	114° 56′	+ 1,772,028	„ 20	+ 1,772,028	July 20

17.—*The Seasonal Dates.* It will be seen that at the remote epoch – A.D. 7171 the Sothic rising took place when the sun's longitude was 61°, that is to say at a *season* corresponding to that we have at present at the end of the third week in May—and the *season* of the Sothic rising has gradually become later.

SEASON OF SOTHIC RISING.

Year A.D.	Sun's Longitude.	Corresponding Season at present about.
– 7171	61° 5′	May 21
– 5900	69° 38′	„ 30
– 5705	71° 0′	June 1
– 4400	80° 4′	„ 10
– 4235	81° 14′	„ 11
– 2900	90° 55′	„ 22
– 2775	91° 53′	„ 23
– 1400	102° 33′	July 4
– 1317	103° 13′	„ 5
+ 139	114° 56′	„ 17

I am indebted to Dr. A. C. D. Crommelin for kindly checking the computations.

THE APPLICATION OF THE KALENDAR TO HISTORY.

By W. M. FLINDERS PETRIE.

18. THE extended recalculations of the elements of the Egyptian kalendar by Mr. E. B. Knobel, which he has favoured us with in this volume, call for some general account of their sources and applications which may be suited to archaeological readers.

The basis of all kalendar changes in Egypt is the broad main fact of ignoring leap year, and having a year of 365 days, continuously reckoned onward through long ages. That the year of 360 days had disappeared very early is shewn by the five additional days—or epagomenae—being named the birthdays of Osiris, Horus, Set, Isis, and Nephthys, the Osiride family. This shews that the year of 365 days is as old as the introduction of the Osiride religion. Also it is most probable that the festival of the Osirification of the king, and installing a crown prince, took place at intervals connected with the leap-year shift of the kalendar; and as this festival appears at the beginning of the 1st dynasty, and is obviously of older origin, it shews that the quarter of a day was recognised, and the extra five days already added, long before that. For all historic periods we have only to consider a continuous year of 365 days, down to Roman times.

19. This reckoning came into relation to two astronomical elements: (1) the position of the sun in relation to the stars, always viewed by the Egyptians as defined by the day in the year of the first visibility of Sirius (Sothis) before the rising of the sun, commonly called the heliacal rising of Sirius; (2) the seasons, which are best viewed as midsummer and midwinter. That these two relations do not keep step together is due to the wobbling round of the earth's pole (like a spinning top wobbling) during a period of about 25,800 years (slightly variable in length), commonly called the precessional period. Thus if we imagine the earth passing round a horizontal orbit, with its pole tilted 23° from the upright, each time that it comes to the same spot between the sun and a star, the pole will have turned to a point nearly 1′ different; or in a thousand years the pole will point about 14° different, and midsummer will be two weeks earlier in the orbit than before.

As the Egyptian kalendar ignored the fractional day beyond 365, it follows that in relation to the stars it retrograded ·25636 of a day (or the fraction over 365 in the sidereal year) in each year, so that it agreed with the position of sun and stars after 1425 years, the first element named above. It retrograded in relation to the seasons ·24224 of a day (or the fraction over 365 in the tropical year) in each year, so that the kalendar agreed with the seasons after 1508 years, the second element named above.

20. So far we have dealt with the kalendar and the earth alone. But we have in the Sothic period to deal also with Sirius as well as the earth. This involves two other considerations. The sun's apparent path in winter is much nearer to Sirius than it is in summer. The distance on the Egyptian horizon (*i.e.* distance in azimuth) between the sun and Sirius was

	Mid-winter.	Nearest	Mid-summer.
+1900 A.D.	9°	3 Feb., 9 Nov.	46°
+ 139	9°	6 Feb., 6 Nov.	46°
−1317	7°	30 Jan., 13 Nov.	48°
−2775	3°	11 Jan., 2 Dec.	52°
−4235	4°	Midwinter.	59°
−5705	14°	„	69°

As in the period we have to deal with the season was between May 30 and July 17, and Sirius is farthest from the sun at midsummer, so these fluctuations of season would make but slight differences in the visibility of Sirius in the dawn, being at their extremes only 2½° from the midsummer distance. But as Sirius rose farther from the sun in earlier times, so it would be visible nearer to the time of sunrise, that is to say at an earlier day of the year, and this would tend to diminish the Sothic period. The amount of this small change cannot be estimated until we may have a series of observations made in Egypt on Sirius and other stars at heliacal rising.

Another variation to be taken into account is the

proper motion of Sirius, or its gradual shift in relation to the stars as a whole. By the observations of its motion this would roughly amount to 3° in 9000 years.

21. Now that we have dealt with the astronomical facts we turn to see how they appeared to the Egyptians.

The seasons are the cardinal fact of astronomy to early man; and their rotation is readily fixed—and the length of the apparent year established—by observing the number of days between the sun appearing on the same point of the horizon at rising or setting. This doubtless formed the first basis of observations, and other questions would be ulterior.

The Egyptian adopting a year of 365 days, divided into 12 months of 30 days, and 5 days over, would find that in a few years his months of the kalendar were slipping back in the seasons and falling earlier, as fixed by sunrise direction. When he had extended his observations further, and included the rising of Sirius, he would find that his kalendar months agreed with the rising of Sirius after 1425 years, and that they agreed with the seasons after 1508 years. The Sirius period is affected by another element, the proper motion of Sirius, and the change of the earth's pole in regard to it. Hence the period of 1425 years was lengthened in appearance as follows :—

Dates.	Intervals.
From −7171 to −5705	1466
−5705 to −4235	1470
−4235 to −2775	1460
−2775 to −1317	1458
−1317 to + 139	1456
+ 139 to +1591	1452
+1591 to +3039	1448

So that during the times of Egyptian history the allowance of 1460 years comes very near the truth. But its coincidence with exactly a day in 4-years shift is only a coincidence, and it must be perceptibly different in other ages.

22. The question now is, of the two adjustments of the names of the kalendar months, and of their numbers,—that to Sirius, or that to the seasons,—which did the Egyptians adopt as a standard? The result is indicated by Mesore being reckoned the first month of the year in the xiith–xixth dynasties, and Thoth being reckoned as the first month in Roman times. This shews that the kalendar was being adjusted to the two incongruous reckonings, of Sirius and of the seasons. If the kalendar names were kept to the Sothis period, as they seem to have been fixed in Roman times, and as the uniform 365-day year would bring them; and if the numbering of the months was adjusted to agree with the seasons at each epoch; then the first month seasonally would move on to 1508 years while the Sothis period and kalendar names were renewed at 1452 to 1470 years; that is to say the month numbers by the seasons would at each Sothis period advance along the kalendar names by 38 years in early times or 56 years in mediaeval times, that is by 10 to 14 days.

As the 1st of Thoth is said to coincide with Sirius rising in +139 A.D., and as the epagomenal days were doubtless kept to the end of the xiith month in all ages, the kalendar dates of the first month fixed seasonally would be

+ 139	1 Thoth
−1317	18 Mesore
−2775	6 Mesore
−4235	24 Epiphi
−5705	14 Epiphi
−7171	3 Epiphi

Such a mode of getting over the precessional difference between the Sothic and seasonal year is quite sound in principle, it would accord with a likely development of observation, and it agrees with the known shift in the position of the first month. The whole kalendar names would move round the seasons not only nearly once in each Sothis period, but seventeen times in the eighteen Sothis periods which come in one precessional period of 25,800 years.

23. From Mr. Knobel's tables here published we can now draw the practical results needed in dealing with Egyptian material. We shall refer everything to seasonal months, in which the longest day is always June 21 as at present. We may note the discrepancy that the day of the Julian kalendar of Sothic rising in +139 is given as July 20, and the rising in our Gregorian kalendar as July 17 in the next table. This is due to Gregory having reformed the kalendar by 10 days instead of 12; so that our kalendar numbers are two days less than the Julian days, *i.e.* the longest day is June 23 Julian. The remaining day, of the discrepant three days, is due to fractions not being stated. We take then the days given in Mr. Knobel's table of Sothic Risings, as the standard on the Gregorian kalendar which we use.

SEASONAL DATES.

Epoch.	Sothic Rising.	1 Thoth falls on	On July 17.	Interval.
−7171	May 21 ...	May 22 ...		
−5900	„ 30	July 18	−5896	
−5705	June 1 ...	„ 31 ...		1508
−4400	„ 10	... „ 20	−4388	
−4235	„ 11	June 10 ...		1508
−2900	„ 22	... „ 23	−2880	
−2775	„ 23	„ 22 ...		1508
−1400	July 4	... „ 24	−1372	
−1317	„ 5	July 5		1511
+ 139	„ 17	„ 17	+ 139	

24. From these seasonal dates we can form the diagram here given (pls. iii, iv, v), in which the seasonal months are in columns, the years are in horizontal lines, and the Egyptian months run diagonally. The day of Sirius rising heliacally is shewn by the slightly inclined line running through June and July. From this diagram, when any two data are given,—of the season, the epoch, or the Egyptian month,—the third can be read off at once; and the rising of Sirius in seasonal months or in Egyptian months can be read for any epoch. Calculation is henceforth needless, as various outstanding small uncertainties exceed the errors of reading this diagram.

It should be noted that this is drawn with Thoth as the first month back to 600 B.C.; and then the epagomenal days are transferred to before Mesore when Mesore was apparently the first month.

It is known that as early as the xiith dynasty the Egyptians had four species of year, the chief year, the sun-beginning year, the great year, and the little year. The identification of these with the varieties of the year which we have here traced as being in use, would need a collation of all passages referring to the years. Such an investigation is a matter of philology, rather than of the chronological results which we are here considering.

THE LENGTH OF EGYPTIAN HISTORY.

By W. M. FLINDERS PETRIE.

25. THE discoveries of the last twenty years have shewn more and more how closely Egypt was bound up with the general civilisation of the Mediterranean. The history of Egypt has thus become an essential part of European history. And as its civilisation was more continuous than that of Europe, and used regular records at an earlier date, so its history has become the backbone of all prehistoric chronology of the Mediterranean.

The acceptance of this history has however been much impaired by the discrepancies between the statements of different modern authors. These discrepancies, it is true, are not in the original data to any serious amount, but only in the arbitrary and varying extent of the modern rejection of the Egyptians' own statements. Yet of that the public can hardly be supposed to be aware. It is with the view of shewing the consistency of the ancient data and history, that the following sections are put together. The difficulties in accepting the general outlines as recorded, lie wholly in the internal consciousness of the critics. We may compare this to the treatment of Vasari's Life of Filippino Lippi. One critic ridiculed it; others proposed various corrections about his parentage. Then his will was found, and other documents, which shew that "Vasari's Life of Filippino is reliable in almost every particular." Unluckily in Egyptology not even original documents will convince a critic, he only denounces the documents as wrong.

Here we shall notice the subjects bearing on the length of the history in the following order:—

The date of the iiird dynasty.
The frequency of monuments.
The remains of the xiiith–xviith dynasties.
The contrast of the xiith and the xviiith dynasties.
The descent of style.
The Semitic conquests of Egypt.
The value of Manetho.
The attempt to shorten the history.

The Date of the IIIrd Dynasty.

26. On uncovering the eastern face of the pyramid of Sneferu at Meydum, many of the casing stones which had been thrown down, were found to have

quarry marks upon them. These quarry marks were of the year xvii, shewing that the whole pyramid was built to its final single slope of casing in seventeen years, out of the thirty years stated for the reign of Sifouris. The facsimiles of the quarry marks are given on pls. v, vi of *Meydum and Memphis*, with translations in the text.

Beside the year there are also stated the month, and sometimes the day, and the months are as follow :—

	In Thoth Year.	In Mesore Year.
3 stones of 2nd *Pert*	Mekhir	Tybi
1 stone of 3rd „	Phamenoth	Mekhir
1 „ 4th „	Pharmuthi	Phamenoth
1 „ 1st *Shemu*	Pakhons	Pharmuthi
0 2nd „	Pauni	Pakhons
2 stones of 3rd „	Epiphi	Pauni

Thus these quarry marks cover half the year, there being examples of five out of six months.

Now the season of quarrying was during the spring and summer. By March and early April all the crops were being cleared off the ground, in the old system of basin irrigation; the people were after that at leisure for public works, so that levies could be raised without any hardship or loss to the country. The inundation follows in July, and lasts over the country till the end of October. This made it easy to transport stones on rafts from the quarries to the building sites. By the beginning of November every man is busy with sowing on the bare mud. Hence the season for quarrying and transport of stone opened in March and closed in October.

We must observe now what are the earliest and the latest dates, which result from the application of the months of quarry marks to the quarrying season. We shall follow here the month numbers beginning with Mesore, as that beginning was certainly used in the xiith dynasty, and Mesore was the nearest month to the first month at this period. Now the earlier the time in the season, the later the year to which it can be attributed; and we must for our limit see how early the Egyptian month Tybi can have come in the seasons. The old system of crops, recorded by Gardner Wilkinson before modern innovations (*Anc. Eg.* ii 398), gives the dates of reaping barley by the end of February, beans by 1 March, lentils by 7 March, and wheat by the beginning of April. As barley was a considerable crop in Egypt spare labour might begin to be levied by 1 March at the earliest, and more men would continually be available until 10 April. If the earliest quarry date of 22nd of 2nd Pert (Tybi) was then the 1 March, that shews the year to have been 4730 B.C. (or 3222 B.C.). The other limit is that the 8th of 3rd Shemu (Pauni) came before the fall of the inundation, at the latest 20 Oct. for navigation. This would give a date of 5136 B.C. (or 3628 B.C.). The limits thus possible for the 17th year of Sneferu are 4730 to 5136 B.C. (or 3222 to 3628 B.C.). It is by no means certain that some quarrying was not continuously carried on, and so a few datings might be found in other parts of the year. But the eight published datings all falling in one half of the year shew so strong a preponderance, that the chance of a few exceptions would not cancel it.

Now the xiith dynasty is fixed in the Sothis cycle, by a rising of Sirius on 17th of the 4th month of Pert in the 7th year of Senusert III. This is always accepted as shewing that the xiith dynasty was from 3459 to 3246 (or 1999 to 1786) B.C.; but the fact of the Mesore year prevailing then should make us set this 120 years earlier. Thus quite irrespective of whether Manetho and the Turin papyrus are correct about the Hyksos period, or whether the chronology there be arbitrarily shortened, the interval between the iiird and the xiith dynasty is now defined between certain limits. The date 4730 less 13 years for the remainder of Sneferu's reign gives 4717 B.C. as the latest possible date for the beginning of the ivth dynasty; the interval to 3459 B.C. is (on the Thoth year) 1258 years as a minimum, or four centuries longer as a maximum; while on the Mesore year the interval is more probably 1138 years, or four centuries longer.

27. Now we can compare Manetho's reckoning over this period. There are some various readings between the versions: of these, one is clearly wrong, that of 409 years for the ixth dynasty, as is shewn by the number of kings. Otherwise the lowest and the highest readings are as follow :—

iv dynasty	284 or 284 years.	
v	218	248
vi	198	203
vii	70	75
viii	100	146
ix	100	100
x	185	185
xi	43	43
Manetho's total	1198 or 1284 years.	
Limits of interval by quarry marks	1138 to 1683 years.	

It is clear therefore that either of the readings of Manetho are within the limit of quarry dating. But if the longer reading be accepted the levy of men need not have taken place till April, which is the more likely course.

The proposal of Meyer to cut this interval down to 300–400 years (*Nachträge z. Aeg. Chron.* 1908, p. 20) would throw the quarrying across the agricultural season, and cease it before the inundation rose and transport was most easy. This would entirely reverse the natural order of Egyptian work, and leave the stones for six months waiting for the next inundation; such a shortening of the history is therefore impossible.

It is now evident that if we accept the Mesore year or the Thoth year for either event, or for both, or for neither, the only choice affected by that question is that between the higher and lower readings of Manetho. It seems that the only logical course (after Meyer's paper on the Mesore year named above) is to accept Mesore as the first month in both the xiith and the iiird dynasties; and following the shorter readings of Manetho we should accept the date for the xiith dynasty 3579 to 3366
(or 2119 to 1906)
and for the end of the iiird dynasty 4777
(or 3317).

The quarrying then began on the 15th of March; or, if later, then some of the longer readings of Manetho can be accepted.

The Frequency of Monuments.

28. As the number of monuments in a given period has been often taken as an indication of the time involved, it is well to see what is the frequency of monuments in various periods, in relation to the conditions of the civilisation.

We will first take the best ascertained periods, about the length of which there is no considerable question. The number of monuments is fairly ascertained by counting them in the Student's History; only as it would be impossible to include every ring and scarab with a king's name, the count is best restricted to buildings, statues, and stones with cartouches. To express the relative frequency the number of monuments *per* century is the clearest statement. It is not to be expected that a remote and a recent period should be comparable, as many conditions are adverse to the earlier age; but periods within the same thousand years may be fairly contrasted, so as to see the extent of variation in different conditions of the country.

As there is no considerable question about the lengths of the dynasties from the xviiith dynasty onward, we state here the number of monuments *per* century in each dynasty from that point.

xviii	144 *per* century
xix	338
xx	127
xxi	23
xxii	47
xxiii–xxv	63
xxvi	118
xxvii–xxx	96
30 B.C.–170 A.D.	32
170–640 A.D.	2·2
640–1140 A.D.	1·6
1140–1540 A.D.	28

The numbers from 30 B.C. onward are not strictly comparable to those before that, as the monuments are rather differently listed; but the general relation of the earlier to the later amounts will not be far out.

Now what are the conclusions to be drawn from this? First, that in the flourishing periods the frequency of monuments is much the same, the xviii, xix, xx, and xxvi dynasties all having over a hundred *per* century. In poorer times this drops to about a third of the amount, as in the xxi–xxv and 30 B.C. to 170 A.D., which average about 40 *per* century. But in a complete decay, and in the Semitic invasion which followed it, there is almost a cessation of monuments for about a thousand years, only about 2 *per* century being dated to reigns in this period.

Nor is this result at all peculiar. In England at least 10,000 churches have been erected in 800 years, averaging 12 a year. Even at the earlier end of the series one church a year is absolutely dated, beside others which are certainly of each decade. But of 400 years of Saxon church building before that not a dozen churches are left, and not as many as 200 fragments can be traced. The frequency of churches before the Conquest is not a hundredth of what it is after the Conquest.

Now comparing together the earlier periods and the later periods of Egypt we find in the

	per century		
xiith dyn.	38	and in early Roman	32
xiiith–xivth	4·4	late Roman	2·2
Hyksos	1	Arab	1·6

We saw above that the monumental frequency shortly before and after the Semitic invasion was about a fiftieth of what it had been in a flourishing age before that. So here it is quite natural that it should drop in the Hyksos period (as stated by Manetho) to a fortieth of what it had been in the xiith dynasty.

In any case we must remember that in all countries and ages monumental frequency may vary as 5 or 10 to 1, without any great catastrophe; and a difference of 50 to 1 may be expected at an overthrow of the civilisation.

29. We now turn to another kind of monumental frequency, which is often appealed to in historical questions. The dated monuments of a king are so generally taken as indicating the extent of his reign, that there is a great tendency to reject any historical statement of the length of reign if it be not supported by some dated monument. Let us test how far the dated monuments fill up those lengths of reigns which are absolutely certain historically.

	Years	Only dates
Nekau reigned	16	year viii
Apries	19	x
Artaxerxes	41	v, xvi
Hakor	13	iv, vi
Nekhtnebef	17	i, iii

Here more than half of the period covered by these reigns is entirely unsupported by any monumental evidence. Yet we know from contemporary history that not a year can be omitted from them. If they had been in an earlier age, many writers would have dealt very arbitrarily with this history, because it was unsupported by dated monuments.

We may see the same result in reigns whose extent is only proved by one single monument; if that one dating had not been preserved in each case there would have been no support for the historical statements. The evidence of 29 years for Amenemhat I, of 26 years for Amenhotep II, and of 35 years for Amenhotep III, each rest on a single monument, and without that evidence not a quarter of the length of these reigns could be otherwise proved. This being so it is obviously probable that in many other cases the required monument is not yet known, and the history is yet unsupported. But that can be no valid reason for doubting the history.

Our conclusions then from the whole view of monumental frequency is that disproportion in the number of monuments proves nothing regarding the length of time when they were produced, and the absence of monumental evidence of the length of a king's reign does not in the least invalidate the historical statements about it. The production and the preservation of monuments have been far too irregular for any negative evidence to be drawn from them to contradict the written history.

The Remains of the XIIIth to XVIIth Dynasties.

30. The monuments of this age have been so strangely ignored that a false idea of the period has arisen. In the xiiith dynasty there are ten kings who have left buildings, statues, or steles, yet these are cut down by Meyer to "only a few (*lit.* pair) of monuments." Beside these there are eight other kings who are known from scarabs, making eighteen kings whose remains are identified out of the total list of 55 kings in the Turin papyrus. To thus possess actual monuments of one-third of a series of such brief reigns—averaging only seven years each—is as much as could be hoped for. Another attempt to belittle this period is by the assertion that the reigns were contemporary. Now in no case can it be shewn that the Turin papyrus or Manetho state contemporary names as successive; on the contrary it is found that overlapping reigns were carefully eliminated. And in the xiiith dynasty, as late as the 23rd king, his statues are found at Tanis on the Mediterranean and in Nubia, proving that the full extent of the Egyptian kingdom was still united at nearly half-way through the dynasty, and that no contemporary king was possible so far.

The Hyksos period of the xvth and xvith dynasties has been also curiously misrepresented. The record of the Hyksos burning the cities, demolishing the temples, and continually making war on the Egyptians, shews that buildings and statues can hardly be expected from this age. There are, however, inscriptions of Apepa I from the Delta and from the south—Bubastis and Gebeleyn: there is a granite altar of Apepa II and a statue: there is a statue and a sphinx of Khyan, and there are many monuments with added inscriptions of the Hyksos. The half-dozen original monuments are all apparently unknown to Meyer, who refers to "only an erased name on appropriated monuments."

But though monuments were almost banned, by the antagonism of the Hyksos, the case is different with scarabs. Here the wildest misrepresentation is current. There are far more scarabs of the Hyksos

than there are of the xi–xii dynasties, or of the xxi–xxv dynasties, or of the xxvi–xxx dynasties; there are altogether about a hundred, with the names of 28 different kings. Maspero calls these "a handful of scarabs" as of small consequence, and Meyer even says that there is only "a pair of scarabs." It is impossible to reach a true view of history if the facts are so imperfectly known.

31. The list of Hyksos kings monumentally known extends to two-thirds of the numbers which are stated for the whole of the xvth and xvith dynasties. They are as follow, with the actual remains known of each :—

Ant-her. Scarab.
Sem-qen. 2 scarabs.
Khyan. Statue, sphinx (Baghdad), jar-lid (Crete), 11 scarabs.
Yaqeb-her. 7 scarabs.
Apepa I. Inscriptions (Bubastis and Gebeleyn), palettes, mathematical papyrus, 10 scarabs.
Nofer-ka-ra. Scarab.
Nub-ka-ra. Scarab.
Kheper-ra. 2 scarabs.
Ka-ra. Scarab.
Aa-neb-ra. 2 scarabs.
Uazed. 4 scarabs.
Sekt. 2 scarabs.
Sam-ka-ra. Scarab.
Noferui-uah-ra. Scarab.
Maa-ab-ra. 15 scarabs.
Shesha. 15 scarabs.
Aa-qer. Scarab.
Kha-user-ra. 7 scarabs.
Sekha-ne-ra. 7 scarabs.
Yaqeb-al. 8 scarabs.
Aa. 8 scarabs.
Aa-hotep-ra. 2 scarabs.
Qar. Scarab.
Ykha. Scarab.
Ya. 5 scarabs.
Maa-ra. Scarab.
Nuby-ra. Scarab.
Er-du-ra. Scarab.
Apepa II. Granite altar, inscriptions on statues and sphinxes.

The order of these kings is indicated by the gradual degradation of the designs upon the scarabs, as may be seen in pl. vi. The full discussion of the reasons for their position is in *Hyksos and Israelite Cities*, double volume, pp. 67–71. Here we are only reviewing the amount of material of this age.

32. The most important work that has remained to us of this period is the historical papyrus the fragments of which are preserved at Turin. It must have been written in the Hyksos period (or immediately after), as it apparently ends then, and the writing accords with that age. When complete it gave a list of all the kings from Menes, with the length of reign of each, and the sum of the years of each period: it was thus a distinctively chronological record. Even from the fragments it can be seen that the xiiith and xivth dynasties originally comprised between 150 and 190 entries of names, and 114 names or fragments of such still remain. Eighteen of these names, scattered throughout, have the length of reign preserved. These total to 92 years, giving an average of 5·1 years to each reign. And 150 to 190 names therefore would imply about 770 to 970 years. This total is of the xiiith and xivth dynasties, and into the Hyksos period, as Apepa is named, but we cannot say how far in that age these columns extended. According to Manetho the xiiith and xivth dynasties covered 637 years, so that is quite accordant with the time indicated by the papyrus. Or if we take the number of kings and the time as in Manetho, the average reign is 4·7 years, which is as close as we could expect to 5·1 years, the average of the lengths of reign left in the papyrus. The accord between the papyrus and Manetho is thus very close, and certainly both authorities fully agree as to the general lengths of reigns and extent of the period.

Thus we have seen that the actual monuments remaining from this age of confusion and destruction, and the almost contemporary record of its history, agree completely with the recorded history preserved by Manetho, and shew that any large departure from that is impossible.

Beside this agreement of the Turin papyrus (of about the xviith dynasty) with the record by Manetho in the iiird cent. B.C., the same scale of history was that accepted in the vth cent. B.C. Herodotos states (ii, 100) that there were 330 kings from a certain point down to his day. When the true order of his history is replaced (the transferred roll, sects. 124–137, coming in between sects. 99 and 100), the point from which he here counts is Asychis (Aserkaf) at the end of the ivth dynasty. Manetho states 345 kings from that time to the date of Herodotos. Evidently there is the same numeration beneath the 341 high priests of Ptah (ii, 142) who lived from Menes to Sennacherib. Thus the general

scale of their history was uniformly reckoned by the Egyptians in the xviith cent., the vth cent., and the iiird cent. B.C., and by Africanus in the iiird cent. A.D.

The Contrast of the XIIth and XVIIIth Dynasties.

33. The most rapid changes of culture always arise where one civilisation is acting on another,—as the Syrian culture on Egypt under Tahutmes III, or the Greek culture on the xxvith dynasty,—yet considerable changes may be seen in Egypt between the xiith and xviiith dynasties, though no fresh culture intervened. That a long period may pass without any new features arising is seen in the slow decay of the style of the ivth dynasty, down to its last stage in the early xith at Dendereh. Here for a thousand years no new style intervened in sculpture. The pottery, however, had entirely changed in that time.

On comparing any group of pottery of the xiith dynasty with that of the early xviiith dynasty there is not a single form in common to be seen. The only clearly descended form is the tubular pot, and that went through a long series of changes which have been traced in the Hyksos period. It would be impossible to suppose that the xviiith-dynasty pottery had arisen soon after the xiith dynasty: if this had been so, most of the forms would have been obviously connected.

The alabaster vases are common in the xiith dynasty, and are mostly closely descended from the forms of the vth and vith dynasties, across eight or ten centuries. But on reaching the xviiith dynasty an entirely new set of forms has arisen, and only the kohl pot shews descent from the old type. The change from the xiith to the xviiith is far greater than that in the thousand years before the xiith dynasty.

The glazed vases are rare in the xiith dynasty, and are never large. In the xviiith dynasty, even before Tahutmes III, they are common; and they are unusually large, bowls, tall vases, and cups, beside great *ankhs*, papyrus plants, *uas* sceptres, and other forms.

The colour of the glaze in the xiith–xiiith dynasties is green or blue-green, with a dry smooth face, and sometimes minute cracks running over the face. In the xviiith dynasty the glaze is a brilliant blue, free and wet, and so flushed with glaze that no cracks are possible.

The scarabs are entirely different in the xviiith dynasty to anything known in the xiith: broad and peculiarly flat backs, with deep curved girdle lines, and hieroglyphs coarse and clumsy, but bold and firm. Nothing like these appear in the xiith, nor in the long and abundant series of the intermediate dynasties.

The forms of bronze weapons, axes and daggers, went through a series of changes, so that the xviiith-dynasty forms are quite unlike those of the xiith. The same is true of the tools, such as the cutting-out knife, the hair-curler, the adze, the chisel, and the axe.

The statuettes also are different; those of the xiith dynasty being rather clumsy and thick, while those of the xviiith are slender and with faces of a thin and graceful type. The clay dolls abound in the xiith dynasty, but are unknown in the xviiith.

The beads of the xiith dynasty are usually globular, of amethyst, garnet, carnelian, or green glaze. Barrel-shaped haematite beads are also frequent. In the xviiith there is very little, if any, amethyst, garnet, or haematite. The carnelian is of a different colour, and jasper is common. Glazed beads are brilliant blue, different in colour and forms from the earlier. There is nothing in common between the series of the two periods.

Rectangular ink-trays of serpentine or basalt, sloping to a narrow base, are characteristic of the xiith dynasty, and descend from a similar form used in the vth dynasty. They are unknown in the xviiith dynasty.

Now turn from the objects for the living, to those for the dead.

In the xiith dynasty the coffin is always of wood or stone, in the xviiith dynasty it is frequently of pottery. The design in the xiith dynasty is regularly of a series of doorways along the side, with the details of doors and bolts carefully painted, directly continued from the ivth dynasty. In the early xviiith dynasty the coffins wrapped in wings appear; and the box coffins have panels with figures of gods. The types are quite different. Here again there is continuity between the ivth and xiith dynasties, but an entire break after that to the xviiith dynasty.

In the xiith dynasty ushabti figures are very rare, and the few known are of dark brown serpentine, and uninscribed. In the xviiith dynasty ushabtis are very common, of wood, of limestone, of pottery, and with full inscriptions.

In the xiith dynasty the wooden models of servants and of boats are usual, and descended from

the vth and vith dynasties. In the xviiith dynasty they are unknown.

In the xiith dynasty there are few traces of the Book of the Dead, and it is not organized as a type. In the xviiith dynasty it is common and has a regular structure.

In every usual product, for the living or for the dead, there is a wide gap between the xiith and xviiith dynasties; and in many cases, such as the stone vases, the glaze, the ink-trays, the coffins, and the funeral figures of servants, the vth and the xiith dynasties, across a thousand years, are more alike than the xiith and the xviiith dynasties. It is therefore impossible to claim that any resemblances between the xiith and xviiith dynasties shew a close relation in time.

The Descent of Style.

34. The artistic style of a period is justly considered as of the highest importance. It is the flower of the abilities and the taste of the period, and it brings us into closer connexion with the time and people than anything else. There are but few ages in which literature can render us so intimate with the feeling of the past. The sculpture, the painting, the ornament, all touch innumerable springs of sympathy in us.

The descent of style is one of the main facts of history. It shews connexions between different countries, and links the ages together. It carries on the national taste of a country across all its invasions, and mixtures of people, and changes of faith. It blends all countries together in each age. The spirit of each country and the spirit of each age cross each other like the warp and weft, to produce the brilliant design of all history.

The rate of changes of style has scarcely any relation to time. The alterations may take place rapidly or slowly. The determining cause is the amount of external influence, and whether that be of an equivalent culture, or of one higher or lower. When equivalent cultures meet they blend and influence each other, as did those of Syria and Egypt in the xviiith dynasty, or as those of Japan and England do now. In high and low cultures crossing, the lower is driven out, either mainly, as in the case of Rome and Gaul, or entirely, as in the case of Spain and Mexico.

The continuance or revival of a style in the same country may take place across any period of time. The classical work of Rome was continued in a feeble state until it revived in the Renascence; and there is much more resemblance between the work of the iind and the xvith centuries in Italy than between that of the xiith and xviiith dynasties in Egypt. The Greek work survived likewise in Magna Graecia, until its decoration took fresh root again at the Renascence.

In other cases there has been an entire break, the older style has disappeared from all living work, and has then been revived again. This may be a conscious revival, such as the work of the xxvith dynasty copying that of the vth dynasty. The copy may, as in this case, be so good that only an intimate sense of the older work enables us to see the poverty of the copy. Another instance is the Nikopol vase, the motive of which is followed twelve centuries later in a Byzantine ivory vase (Dalton, *Ivory Carvings*, x). A later instance of this conscious copying is in the recent English revival of earlier architecture, such as the Early English style of the Law Courts, and countless copies in church building.

In other cases there may be an unconscious revival, the sources of which are so obscure that we are tempted to attribute it to inherent national taste, reasserting itself after having been overlaid by foreign styles. Such is the reappearance of Late Celtic ornament under Louis XV, or of Etruscan figure work under the later emperors.

In all these cases it is evident that the length of time has little effect. A style may continue for a thousand years; or it may be greatly changed in a generation, when a rival force acts on it. It is quite hopeless to deduce conclusions as to the intervals of time between two periods by changes in style being large or small. A large difference between two periods, especially in many different lines, may indicate a long time if no new influences have come in meanwhile. But a close resemblance may be equally seen whether a few decades or many centuries have intervened. It is therefore impossible to set aside written history on the ground of questions of style.

Lately a defence of shortening the history has been adduced from the styles seen at Knossos, and the collocation of ruins there. But the evidence of continued style in an island civilisation is of even less value than elsewhere. The collocation of ruins is as meaningless as a modern house in London built upon the Roman wall, for the ruins at Knossos have been swept away more than once to level the ground for new structures. And any evidence from Greece

has the loose joints of its contemporaneousness with Egypt, in which there is considerable uncertainty at each point of contact. The Greek evidence, so far, has no weight as against the precise record and long continued agreement of the Egyptian reckoning.

The Semitic Conquests of Egypt.

35. There is no view of history which gives more reality to our conceptions, than the comparison of two periods which are similar in their life and conditions. When we can trace a close resemblance existing in known particulars, we are able to use our further knowledge about one age to the clearer understanding of the other age, and whatever is in common in the accounts of both periods is strongly corroborated by their agreement.

It is from this point of view that we now compare the two Semitic conquests of Egypt, that by the Hyksos and that by Islam. That the Hyksos were in the main a Semitic people, is indicated by their names, and perhaps most clearly by their title. The scarabs of the earlier Hyksos, Ant-her, Semqen, and Khyan, call the chief *Heq Setu*, "prince of the deserts," and the same title is given to Absha the Bedawy chief, figured in the tomb at Beni Hasan. They were in the state of culture of the Bedawy, trusting to the bow as the main weapon, and ignorant of any constructions of stone, brick, or timber. These conditions were similar to those of the Arab tribes of the deserts who flowed into Egypt, animated by Islam. Here we shall follow the statements of Manetho about the Hyksos, and his dates as confirmed by the Sothic cycle.

The Arab conquest had been preceded by a long period of gradual decay in Egypt. The land had been steadily declining throughout the Roman period, looked on by Rome as simply a source of food and revenue. The currency had steadily diminished until it disappeared under Constantine, and Egypt resorted to barter because it was too impoverished to own a coinage. This period of decay may be looked on as beginning with the conquest by Augustus, and down to the Arab invasion it lasted for 670 years. Similarly the Hyksos conquest was preceded by the long decay of the xiiith and xivth dynasties, stated to have lasted for 637 years. This decay was therefore of about the same length as the period of decay under the Romans. In the xiiith–xivth dynasties we meet with Syro-Babylonian kings of Egypt, Khenzer and Khandy; and if the foreigner thus reached supreme power, there must then have been a large number of foreign immigrants. This is the usual course of a great migration, as in the Roman age when Arab troops were employed to garrison Egypt, the forerunners of the conquest by Islam. Similarly in Britain the Batavians and Saxons were moving over for some centuries before the great Saxon migration of the fifth century.

After the Arab conquest in 641 A.D. there was a period of confusion and rebellions, while the government was gradually becoming systematized. This lasted 109 years, until the firmer and more decisive rule of the Abbaside khalifahs began in 750. Similarly we read that there was a century of confusion at the Hyksos invasion, until there began the line of great kings.

The period of the great khalifahs was practically ended by the madman Hakim, 1021. After him Egypt had scarcely any authority in Syria, and, broken up internally, it was by 1071 in the hands of the Seljuk Turkmans. Thus the great rulers of Egypt and Mesopotamia reigned from 750 to 1021, 271 years. Similarly the great kings of the Hyksos ruled from Mesopotamia to Egypt—as seen by the monuments of Khyan—during 284 years.

The next period is that of further tribal movements from Asia, and a less stable government, which continued 496 years from 1021 to the Turkish conquest in 1517. After the time of Saladin and his immediate successors, the latter half of this age was a period of continual degradation under the Mamluks, until the conquest by a fresh race. This was parallel to the later Hyksos rule, when they retained possession for 518 years, as the xvith dynasty. That age was closed at the foreign conquest by a fresh race, the Berbers of Nubia, who formed the xviith dynasty. The Hyksos scarabs clearly shew the continued degradation which took place.

After the Turkish conquest in 1517 there was an interval of 254 years before Egypt was powerful enough to attack Syria, and to conquer it in 1771 under Aly Bey. So also after the Berber conquest in 1738 B.C. Egypt was at last, after about 208 years, capable of attacking Syria under Tahutmes I. In modern times the main conquest was by Ibrahim Pasha 1831–39, 60 to 68 years after the first attack; and similarly the main conquest under Tahutmes III was about 50 to 71 years after the first attack of Tahutmes I. But for European intervention Egypt would have retained Syria at present, just as it did under the xviiith dynasty.

36. We can now review the various stages of the two Semitic conquests of Egypt, and compare the length of their periods; the first conquest is stated as recorded by Manetho, the second conquest being since his time cannot therefore have had any possible influence on his record.

We see below how closely parallel the history of Egypt has been under the two great Semitic invasions. There has never been a difference in the main events of more than a generation along the two scales. And as the later Semitic conquest is unquestionable in its historic outlines, so the earlier conquest is by this comparison rendered historically probable in its general features.

B.C.		Years.	Years.		B.C.	Interval.
3293	xiii dynasty				30	3263
2640	xiv „ } Decay during . .	637	670	Decay under Roman rule	A.D. 640	3280
	100 years confusion . . .	100	110	Omayyad rulers.	750	3290
2540	xv dynasty great kings . .	284	271	Great khalifahs.	1021	3277
2256	xvi dynasty lesser kings . .	518	497	Lesser rulers.	1517	3255
1738	xvii dynasty, Berber conquest until			Turkish conquest until		
1530	Conquest of Syria by Tahutmes I.	208	254	Conquest of Syria by Aly Bey	1771	3301
1480–1461	Main conquest of Syria by Tahutmes III	50 to 71	60 to 68	Main conquest by Ibrahim	1831–1839	3311 3300
				Average interval		3285

The Value of Manetho.

37. When we possess a history of a highly civilised country, which maintained a continuous chronology, and this record was drawn up by a native who was a skilled writer, and who was likely to know of all available sources of information, we need very strong evidence to warrant us in setting it aside. It cannot be treated as if it had no weight, and as if we might reject any part of it on vague suppositions. Some stronger and more decisive evidence is needed, before we can venture to adopt a different view to that of the general belief of the native scholars during long ages.

Unfortunately the history of Manetho, written early in the Ptolemaic period, has perished in its original form, and we only possess brief lists of kings extracted by later writers. The best of these is Julius Africanus, 221 A.D., and inferior is Eusebius, 326 A.D., known in Greek and in an Armenian version. The material is therefore only second-hand; and the continual discrepancies between the extracts, and between the items and totals in each author, shew how much the text has suffered in its details.

What should be the appreciation of a work which has been thus injured? Errors of miscopying of years will affect an item or a total, but will not change both; and happily there has not been an editor who has tried to reconcile the items and totals. Then it is obvious that no very large addition could be made to a reign, or it would be abnormal. Thus, although many casual errors might be made, they would probably tend to balance each other, and not being of very large amounts the total would probably remain much the same. No corruption that is not made for a purpose will alter the scale of a history to any great extent. We should expect to find then that, though every single item might be proved to have suffered some corruption, yet the totals would not be very far from the truth.

38. We will now see how far the general periods of Manetho are in agreement with other information that we have, starting from the latest period as being the best known.

From Alexander's conquest of Egypt back to that of Cambyses, the interval is given by Manetho as

xxxi dynasty	9 years
xxx	38
xxix	20
xxviii	6
xxvii	121
	194 years

The last item is slightly corrected by taking Eusebius' version of 3 years for Cambyses in Egypt, in place of 6 years of Africanus, which is an evident error, as the whole reign of Cambyses is given as 5 years.

Now this total is checked by the dates externally known, 332 B.C. for Alexander, 525 B.C. for Cambyses, making **193** years interval.

The next period is from the Persian conquest back to the beginning of Psamtek I. This duration of the xxvith dynasty is in Manetho $54 + 6 + 6 + 19 + 44 + \frac{1}{2} = 129\frac{1}{2}$ years. The earlier point is fixed by Assyrian history, the reign of Tanutamen lasting three years after the death of Taharqa in 667, thus giving 664 B.C. for Psamtek. And 525 B.C. of Cambyses' conquest, from 664, leaves **139** years for the interval. The error of 10 years in Manetho is by 10 years having dropped off the 6 years attributed to Necho, which should be 16 years. The other reigns are quite correct in detail.

There has been great confusion in the xxiind dynasty and other parts; but, bad as the corruption has been, it very nearly balances on the whole. The totals in Manetho are

xxv dynasty	40
xxiv	6
xxiii	44
xxii	120
xxi	130
xx	135
xix	209
xviii	263
	947 years

The beginning of the xviiith dynasty is fixed by the rising of Sothis to 1587 B.C., as is generally agreed. Now 1587 — 664 leaves **923** years for this interval.

For stepping back to the xiith dynasty across the Hyksos times the statements of Manetho are

xvii dynasty	151
xvi	518
xv	284
Confusion	100
xiv	184
xiii	453
	1690 years

The century of confusion has apparently been dropped from the dynastic lists of Manetho, as no kings reigned; but it is specified in the extract from Manetho made by Josephus.

For this interval there is a Sothis dating in the xviiith dynasty, as mentioned before, and another in the xiith dynasty, as mentioned in the section on the date of the iiird dynasty. The interval given by these is 3246 — 1587, making **1659** years: or if the Mesore year is followed in the xiith dynasty, then 3366 — 1587 makes **1779** years.

From the xiith dynasty back to the beginning of the ivth the lists of Manetho give (without any corrections from other sources) the following lower and higher readings:—

	Lower.	Higher.
xii dynasty	160 or	245
xi	43	43
x	185	185
ix	100	100
viii	100 or	146
vii	70 or	75
vi	198 or	203
v	218 or	248
iv	284	284
	1358 or	**1529** years

This interval, as we have seen, is well indicated by the seasonal dates under Sneferu, which give 4717 B.C. as a *minimum*, with possibly five centuries earlier, for the rise of the ivth dynasty; and this, less 3246 B.C. (or 3366 B.C.) for the close of the xiith dynasty, makes **1471** years (or **1351** years) as the *minimum* period.

For the first three dynasties Manetho gives

iii dynasty	214
ii	302
i	253
	769

For this there is no seasonal dating; and the Palermo stone, apart from any use of Manetho, will not give any result for the total of reigns. But a new kind of evidence may be gleaned from that record, as M. Jéquier has pointed out. The averages of the Nile levels are in the

1st line	5·30 ± ·20 cubits
2nd	4·57
3rd	3·49
4th	3·50 ± ·20
5th	3·28

These numbers show a steady change; and, as they decrease, they must be the depth below a mark from which measurements were taken down to the high Nile. On plotting all the results in a diagram it appears that there was a total change of 2·4 ± ·4 cubits, or 1·25 ± ·2 metres in level down to the 13th year of Sneferu. The interval is either $\frac{4}{5}$ or the whole of the time from Menes to the 13th year of Sneferu, according as the fragment was to the left-hand or right-hand side of the whole table. That gives then between 1·55 and 1·25 metres ± ·20 as the rise of the Nile from Menes to the 13th year of Sneferu. The rate of rise has been variously estimated as being from 1·25 to 1·1 metres in a thousand years. This gives then about **1200** years, ± about **400** years, as the length of the first three dynasties. It is but a very rough datum, but it shews that Manetho's 769 years is not likely to be shortened, and it is of interest as a purely physical dating. The more general appeal lies to the actual remains of the kings of the 1st and 2nd dynasties, which agree as closely with Manetho's list as our information at present goes. Of the eight kings of the 1st dynasty, all are now identified with those of Manetho. This accuracy in the most remote period should make us have confidence in the statements about the nearer ages.

39. Now we can review the statements of Manetho, and compare them with the periods of time as ascertained from purely external sources, without any dead-reckonings from monuments.

	By Manetho.	Externally.
Alexander	(starting at 332 B.C.)	332 B.C.
xxvii dynasty begins	526	525
xxvi „ „	656	664
xviii „ „	1603	1587
xiii „ „	3293	3246 or 3366
iv „ „	4651–4822	4717 or earlier
i „ „	5420–5591	5500 to 6300

Now these are by no means the exact figures to be accepted as the most probable truth, as many small corrections can be made from monumental sources; but such would not make altogether more than a century or two of shift. The point in question here is to shew that, from sources entirely outside of Manetho, the long periods can be checked; and that the discrepancies are immaterial as regards the general length of the periods.

No doubt it would be possible to choose in some cases the worst readings rather than the better readings of Manetho; any ancient author can be made absurd by choosing out readings which are obviously discordant with facts otherwise known.

Thus we see that the condition of the abstracts of Manetho agrees with what we should expect, were they copied from a true history. The different readings of the abstracts shew them to have many small corruptions; but such errors nearly balance on the average, and the net result is in very close agreement with the dating as derived from external sources.

The Attempt to shorten the History.

40. In recent years an assumption has grown up that the time shewn by the Egyptian lists of the Turin papyrus and Manetho is to be arbitrarily retrenched. Various shortenings of the history have been proposed, one of which, I confess, may be seen in the Student's History.

The whole position was rendered acute by the discovery of a Sothic rising in two papyri from Kahun, which proved that the xiith dynasty ended either at 1786, or a Sothis cycle earlier at 3246 B.C. That there was no large error in the statement was confirmed by the months of quarrying in Sinai during the xiith dynasty, which at either of these two dates just extended over the suitable season, and also by the date of the flax harvest in Egypt.

Unfortunately the habit of arbitrary shortening of the history had become so strong, that the later date was adopted by many writers, in spite of the insuperable historical difficulties, and without even looking at the probability of the earlier date, which accords with the Egyptian histories.

The historic difficulties in the published view of compressing the xiiith–xviith dynasties into 1786–1580, or 206 years, oblige those who adopt this position to throw over the Turin papyrus and Manetho; and to assume that the reigns recorded were overlapping eight deep, since 1666 years of reigns have to be compressed into 206 years. The prospect of eight contemporary rulers during all this time, and of their being all recorded by one historian, is quite improbable.

Moreover to as late as Sebekhotep III, who held all Egypt from the sea to far up in Nubia, we have certainly no right to imagine a division of the country. The 23 reigns, thus vouched for, amount to over a century on the average length of reign in the dynasty. Hence for the remaining century we must suppose sixteen contemporary rulers at once in the country in order to account for the names.

A SEASONAL DATE OF THE HYKSOS PERIOD

It is obvious that if a seasonal date could be found between the xiith and xviiith dynasties it would be of the greatest value in determining whether two centuries or sixteen centuries elapsed between those epochs. If there were only two centuries, the seasons could not have shifted more than a couple of months; if there were sixteen centuries, the seasons must have shifted round the whole year between the xiith and xviiith dynasties.

Such a datum does exist, though it has not yet been brought into the field. The Rhind Mathematical Papyrus is dated in "the 33rd year, 12th month, . . . day under the king Aa-user-ra," that is, Apepa I of the xvth dynasty. And it has some jottings of common daily notes added at about the same age.

> "Year II, 1st month, day 3, birth of Set.
> The majesty of this god caused his voice (to be heard).
> Birth of Isis, the heaven rained." (Griffith in *S.B.A.* 1894, 246.)

First we may clear a minor question out of the way. These birthdays of the Osiride cycle of gods properly fell on the epagomenal days at the end of the year—Set on the 3rd, and Isis on the 4th. But the scribe here forgot the five days epagomenal, and went on direct to the next month. Hence these dates are really on the 2nd and 3rd day before the end of the year.

The meaning of the "1st month" at that period must have been Mesore, according to all our facts (see pp. 9, 22), and it will be so reckoned here; but as some readers may still believe Thoth to have been always the first month, the results on that view will be added after in parenthesis. In no case would this notably affect the question.

The essential fact is that there was thunder three days before the new year, and rain on the following day. Referring to the diagram (pls. iv, v), it is easy to see what this means seasonally. According to the arbitrary short chronology, the date of this entry can hardly be before 1750 B.C., even on the Mesore year, nor is it likely to be later than 1600 B.C. on the Thoth year. At those dates this day of rain would have come on Sept. 17 or Sept. 9. We must reverse the seasons and accept severe bad weather—thunder one day, and rain the next—in the tranquil time of summer about the first half of September, when such weather is unknown in Egypt. This seasonal result is as impossible as the quarrying in the agricultural season required by the arbitrary shortening of the iii—xii dynasty interval (p. 12).

Now we turn to see how this seasonal date agrees with the chronology of the Egyptians. We have noted that the xvth dynasty—the Hyksos—began about 2540 B.C. (p. 22). The recorded reigns are: Salatis, 19 years; Beon, 44 years; Apakhnas, 36 years; Apophis, 61 years; Ianias, 50 years. Adding these to 2540 B.C., we reach 2409 B.C. for the date of the papyrus in the 33rd year of Apepa I (Apophis); and the 11th year, in which the entry of rain is dated, cannot be earlier than that year of Ianias his successor, 2370 B.C. It may easily be of some later reign, but is not likely to be more than a century or so later, as the frail papyrus was still in common use.

At this date of the note, at the earliest 2370 B.C., the day of rain would fall on Feb. 14 (or March 16). Or if the note was a century later, then on Jan. 20 (or Feb. 24 on Thoth year). Hence the chronology of Manetho and the Egyptians requires this rainy day to have been just in the wettest season, at the end of January; and as rain is rare in Egypt during December, we may say that it is very unlikely that the date can be brought a couple of centuries later.

Hence the much-needed seasonal date of the Hyksos proves to be in close accord with the long chronology, used by the Egyptians, and entirely contradicts the modern arbitrary shortening of the history.

W. M. F. P.

Hazell, Watson & Viney, Ld., London and Aylesbury—11/7682.

In the xiiith dynasty alone we can prove the presence of eleven successive kings in Upper Egypt, at Thebes or close by at Abydos; and on the average reign of 5·1 years they vouch for 56 years, which cannot be reduced by any supposition of contemporary rule. Even on the extreme view that there were no other Theban kings, this fact alone leaves only 150 years for the xiv–xvii dynasties. The greater part of this would be taken up by two long reigns of Khyan and Apepa I, who cannot have been contemporary as they held the same regions, and they are credited with over a century between them. Thus it seems entirely impossible to frame any view of the known names, or known remains, or recorded history, which could agree to so short a period. Even if the Mesore year be applied to the xiith dynasty the difficulties would scarcely be decreased.

What then are the reasons which have been alleged against the longer period, and against the recorded history? They have seldom been stated. Mahler in his chronological discussion never even mentions a longer period. The only reasons ever given seem to be those in Meyer's *Aegyptische Chronologie*, 1904, p. 61. In that we start with the statement that "the setting back of the Sothis period is an absurdity that does not enter into consideration for scientific discussion." Such is the spirit in which the actually recorded history is handled, when the alternative of supposing eight, or even sixteen, contemporary kings is preferred. The reasons assigned for this decision, that the historical statements are too absurd to discuss, are

(1) That the culture is so little changed from the xiith to the xviiith dynasty. We have just reviewed the differences between these periods, and seen that in almost every respect an entire change took place between those ages.

(2) That the language is so little altered. But the change from the xiith to the xviiith dynasty is at least equal to that from the vith to the xiith dynasty; and that period is already fixed as being some six centuries in length.

(3) That there are so few monuments, "only a few (*lit.* pair) of monuments of Sebekhotep and Neferhotep and their consorts, and a few traces of poor graves and scarabs." In the section on the remains of the xiiith–xviith dynasties we have seen how large an amount there is of this period, which seems to have escaped Dr. Meyer's knowledge. And in the section on the frequency of monuments, we have seen that the decline during the period of decay and invasion is just what accords with the same conditions later on. Monumental frequency varies as 50 to 1 in different conditions of a country.

And what else is there alleged against the history, and in favour of a unique record of eight or more contemporary kings? Nothing whatever.

We have also shewn in the previous sections that the question of style, which has been vaguely talked about, is entirely useless for proving the shortness of a period. The rate of change of style varies immensely, and fifty years at one time may make more difference than a thousand years at another.

Let us then take a single view of the reasons which are alleged for the shorter and longer reading of the history.

The Shorter History.	*The Longer History.*
(1) Little changed, xii–xviii.	(1) Every product and custom altered.
(2) Little change of language.	(2) Similar to the change from the vith to the xiith dynasty.
(3) Few monuments.	(3) More than in the parallel period later.
(4) Style of art similar.	(4) Style different; and continuity like that over other long periods.
(5) o	(5) Strict parallel of the Hyksos and Arab invasions.
(6) o	(6) General correctness of all of Manetho's periods when compared with external data.
(7) 8 (or 16) contemporary kings during the whole period.	(7) The consistent usage of the consecutive historical record of the Turin papyrus, which has the summations of a continuous chronology at intervals.
	The general beliefs of the Egyptians in the vth century B.C.

It seems impossible to accept the arbitrarily reduced history as satisfactory, and to reject the history given by the Egyptians as "an absurdity that does

not enter into consideration for scientific discussion." Were we to condemn either side in this unhistorical manner, it would seem that the shorter history might well be thus rejected.

The Month of the Exodus.

41. There are two possible origins for the name of the month Abib, in which the Exodus took place. The Passover was in this month, at the full moon on the 14th day, and this agrees with the Jewish kalendar, which was lunar (with an intercalary month to keep the months to the same seasons), so that the full moon would naturally be on the 14th day. The usual view is that Abib is the month of wheat being in the ear. The word is used of the barley in ear, at the plague of hail (Ex. ix 31), and of the offering of green ears of corn parched (Lev. ii 14). It is derived from a root "to be green," or "to produce." This fully accounts for the name; but it is strange that, if so direct a source for it was known, this name should entirely disappear later, and Nisan be substituted.

Another suggestion has been made that it is the Egyptian month Epiphi, which is written Abbi in later Aramaic. With the kalendar which is now before us, we may see how far this is possible. The limits of Abib, in order to have the full moon next after the vernal equinox, are that its first day shall be between 7 March and 4 April. And if the lunar month was named from the Egyptian month with which it most nearly coincided, the limits for the first day of Epiphi would be 21 February and 20 April. The dates of the month being at these limits are 1032 B.C. and 1280 B.C. Thus at the probable date of the Exodus, about 1220 B.C., Epiphi would most nearly coincide with Abib in case of a late Passover moon. Of course this does not prove the derivation of the name to have been from the Egyptian, but such a source is not contradicted by the facts of the kalendar.

The Dates of the Dynasties.

42. For reference it is desirable to state what may be taken provisionally as the dates of the dynasties, accepting the Mesore year for the xiith dynasty and earlier ages, but retaining the Thoth year in the main datum of the xviiith dynasty. Such a course is not logical; but there is so general an agreement about the xviiith dynasty that I would not venture to put it 120 years earlier (in accordance with the Mesore year then used) until more consideration has been given to it.

Dynasty	i	5546–5293
	ii	5293–4991
	iii	4991–4777
	iv	4777–4493
	v	4493–4275
	vi	4275–4077
	vii	4077–4007
	viii	4007–3907
	ix	3907–3807
	x	3807–3622
	xi	3622–3579
	xii	3579–3366
	xiii	3366–2913
	xiv	2913–2759
	xv	2540–2256
	xvi	2256–1738
	xvii	1738–1587
	xviii	1587–1328

THE NOMES OF EGYPT.

By W. M. FLINDERS PETRIE.

43. FROM the earliest times that we can trace, Egypt was always divided into separate principalities or administrative districts. The earliest divisions were about the size of the modern *mudiriyehs*; but they were subdivided as the cultivation and population increased. Thus the primitive thirteen regions, which made the corn-images of Osiris in prehistoric times, became in later times about a hundred.

As these divisions thus fluctuated, the developments which they underwent should be noted historically. The nome lists which we have for study are mostly of a late period; but the lists of cities where ceremonies took place, or where the fourteen or sixteen parts of Osiris were deposited, shew us what were the principal centres at a very early date. Other indications may be gleaned from the

double use of names for contiguous nomes, inner and outer, or south and north, which shew the larger districts which were subdivided. Another guide is the order of the nomes in the Delta, the basis of which is systematic, though interrupted by insertions out of order, which are therefore later.

In following the various publications the hieroglyph text should be used, as translators have made curious errors in well-known names, and a later compiler has even added to such blunders. The principal sources of lists are the following, lettered as in the table pl. vii.

A. Corn-figures of Osiris made at 13 cities. Dendereh. (Dümichen, *Geog. Inschr.* II, i–iii ; Brugsch, *Zeits. Aeg. Spr.* 1881, 79 ; Loret, *Recueil*, iii, 44.)

B. Ceremonies performed at 16 cities. Dendereh. (Dum. *Geog. Ins.* II, iv ; Brugsch, *Z. A. S.* 1881, 84 ; Loret, *Rec.* iii, 49.)

C. Feasts of agriculture at 16 cities. Dendereh. (Dum. *Geog. Ins.* II, xviii ; Brugsch, *Z. A. S.* 1881, 97 ; Loret, *Rec.* v, 87.)

D. Relics of Osiris kept at 16 cities. Dendereh. (Dum. *Geog. Ins.* II, xvii ; Brugsch, *Z. A. S.* 1881, 96 ; Loret, *Rec.* v, 85.)

E. The order of the Delta nomes consecutively along five lines of the Nile, beginning at the west. Twelve are thus in order, and eight others have been inserted later out of order.

F, G. Cities with relics of Osiris. These are thirteen in Upper Egypt, where only seven cities appear in the earlier stages. Nine nome cities were without actual relics, and are therefore later. (F, Dum. *Geog. Ins.* III, i ; this list scarcely notices the Delta, and G, the Delta list, in III, xliii–liii, is so full that it belongs to a later age.)

The standard list of nomes is found from the xixth dynasty at Abydos (Mariette, *Abydos*, i, 11), down to Ptolemaic copies at Dendereh and Philae (Dum. *Geog. Ins.* III, iii–xxv, xxvii–xli, lix–xcvii). It is so generally followed as a standard that it is used here as the first column of the table.

H, J. The increased list of nomes in the xviiith dynasty is shewn by the *ha* princes, and by the lists of Upper Egypt in the xixth dynasty, H (Mariette, *Abydos*, ii, 12), and of the Delta, J (Mariette, *Abydos*, i, 14). Another list of additional nomes is too fragmentary to be used as a whole (Dum. *Geog. Ins.* I, lxv).

K. The coinage of the reign of Hadrian shews the recognised administrative divisions then ; but, as these coins are rare, there may have been coinage for other nomes which has not yet been found. (J. de Rougé, *Monnaies des nomes.*)

L. The writers of Roman age, Strabo, Pliny, and Ptolemy, give lists of nomes, all of the names in which are here given.

The two lists in the Revenue Papyrus of Ptolemy Philadelphos are entirely for specifying the rates of tax, and the amount of oil crop ; their order is therefore artificial, and they refer solely to taxation, so that their omissions are consequently of no value as compared with the lists of the Roman period.

We here avoid the complex questions of the identifications of sites, as we are only concerned with the number and general position of the administrative divisions. The *Géographie ancienne de la Basse-Egypte* of J. de Rougé is followed as the best authority for the Delta.

44. We shall here consider the Delta and Upper Egypt separately, and the Delta first because there are more clues to the successive subdivisions of the nomes. The Roman numerals here will thus refer only to the Delta nomes until we deal with Upper Egypt. The normal list of the nomes according to the standard of the xixth dynasty, probably transmitted from the xiith, and continued for religious purposes to Ptolemaic times, is as follows :—

	Egyptian Name.	Greek Name.
i	Anbu-hez	Memphis
ii	Khensu	Letopolis
iii	Ament	Marea (Libya)
iv	Sap-qema	Prosopis
v	Sap-meh	Sais
vi	Ka-khas	Xois
vii	Nofer-amenti	Metelis
viii	Nofer-abti	Heroopolis
ix	Aty	Busiris
x	Ka-kem	Athribis
xi	Ka-heseb	Pharbaithos
xii	Theb-aht	Sebennytos
xiii	Heqa-ames	Heliopolis
xiv	Khent-abt	Sethroë
xv	Tekh	Hermopolis
xvi	Ha-mehyt	Mendes
xvii	Sma-behudet	Pakhnamunis
xviii	Am-khent	Bubastis
xix	Am-pehu	Buto (eastern)
xx	Sepdu-kemhes	Phakusa (Arabia)

The Egyptian form is the name of the nome; and the Greek is the name of the capital, from which that of the nome was later formed, except in

three cases. The iiird nome was known as Libya; the xixth is not identified as a Greek nome, but its capital was the eastern Buto; the xxth nome was called Arabia. After this we shall denote the nomes by their numbers in most cases. The table (pl. vii) should be followed in this account: in it the nomes are numbered in the order of each list.

45. The earliest stage which we can trace (Map i, pl. viii) is that of eight nomes in the Delta, ii, iii, v, x, xiii, xv, xvii, xviii. This is an earlier stage than even the shortest list, that of the Corn-Osiris in A. With four in Upper Egypt these make twelve divisions altogether; earlier than the sites of the fourteen parts into which Set divided Osiris.

Next comes the division of the ivth nome out of the vth, separating the nome Sap of the goddess Neit into the south and north halves. This is the stage of the list A, Map i, which is marked off from all later lists by its ignoring Memphis, and shewing therefore an arrangement of the country older than the dynastic age. In other words the ceremony of making the corn-figures of Osiris comes down from the prehistoric period.

The next stage is that of including Memphis, and Busiris in list B. The latter is given as Daddu, which might be confused with Mendes; but in the list of relics of Osiris (Dum. *Geog. Ins.* III, xliii–liii) Daddu is given in the order as the city of the ixth nome, proving its position in the earlier lists. In both nomes the name is an abbreviation of "the city of Osiris lord of Daddu." It is probable that this title is "lord of the four sky-pillars," and only by abbreviation is either town called simply Daddu. The figure of a prince, which is the sign of the ixth nome, is that of Osiris.

The lists C, of the Feast of Cultivation, and D, of the cities containing the sixteen relics of Osiris, seem to be contemporary. Both of them drop out Koptos and insert Tentyra instead; both bring in Lykopolis in addition to Kousai; both drop out Letopolis, which was ousted by Memphis. The nomes up to this stage are shewn in Map ii.

46. The next stage is observable in the Delta nomes, where we can trace twelve of them in regular order (see Map iii), as stated in the lists of later times. i Memphis is at the head of the Delta; from here the western side beyond the river was followed first, ii Letopolis and iii Libya occupying the western border. Then between the western and middle arms of the Nile come iv Prosopis, v Sais, vi Xois, and vii Metelis in order. Down the east of the middle, or Sebennyte, arm come x Athribis and xii Sebennytos. Farther east is the line of xiii Heliopolis, xv Hermopolis, and xvii Pakhnamunis. While along the eastern desert lie xviii Bubastis (the sanctuary of which was the Iseum at Hat-sera) and its subdivision xix the eastern Buto. Thus the whole Delta was divided along five radii, like the sticks of a fan, in regular order down each radius. The total nomes at this point were

i, ii, iii, iv, v, x, xii, xiii, xv, xvii, xviii, xix.

It should be noticed that xii Sebennytos here first appears, and is substituted for the older ix Busiris which was close to it.

The earliest addition to this order seems to have been xvi Mendes, taken out of xv Hermopolis. The relics at Mendes are duplicates of those of older cities, the phallus of Diospolis and the spine of Busiris, both of which occur in the fourteen great relics; thus marking the secondary position of Mendes by its borrowed sanctity. xix Buto was parted from xviii Bubastis, the nome of Am being divided into inner and outer; and the eyebrows of Osiris were adopted there, as a trifle hitherto unclaimed. xi Pharbaithos took the ear, leaving only one ear to Sais. vi Xois claimed the fluids, vii Metelis the shoulders, viii Heroopolis the entrails, already allotted to nomes of Upper Egypt. All of these seem to be claims outside of the main relics. The *zerti* of Metelis is explained by the list of parts of *Sokar* in Dum. *Geog. Ins.* II, where *zer* is stated to be *pesed*, a part of the back, translated "shoulder" by Brugsch. As burdens are said to be carried on *pesed*, it denoted the upper part, or shoulders in dual, as *zerti*. This agrees with the relic of the shoulders appearing between the standards of Sais and Letopolis (Petrie, *Abydos*, i, 28 *d*), and with the attribution of the shoulders to the Metelite nome, as I concluded last year (*Memphis II*, 10).

Last of the additions to the nomes seem to be xiv Tanis which had the *dad* amulet, and xx Arabia which had an amulet of turquoise, *mafkat*, probably the left *uza* eye otherwise attributed to it. These nomes seem to have been formed so late that they could not well claim an actual relic.

We thus complete the standard list of twenty nomes of the Delta (Map iv) as given in the xixth-dynasty lists at Abydos, which continued as the religious standard till Ptolemaic times. Probably the actual organizing of this list belonged to the xiith dynasty.

47. Already in the xixth dynasty there was a far

closer subdivision in actual use, as seen in hall D at Abydos (Mariette, *Abydos*, i, 14), which gives thirty instead of twenty nomes in the Delta. Such a list shews the actual condition in the xixth dynasty, while the religious lists of past ages with only twenty nomes, or sixteen or fourteen nomes of the Osiris worship, were perpetuated for ritual purposes down to the end of the kingdom. So sharp a difference between the religious and political lists as early as the xixth dynasty, prepares us to recognise the very early forms of the lists surviving in the late documents for religious purposes.

The Delta in the xixth dynasty (Map v) is represented by the following nomes, the names being on the nome standards in the list of Sety I (Mariette, *Abydos*, i, 14). See column J in the table pl. vii.

Nome.		Order.
i	Memphis	1
ii	Letopolis	2
iii	lost (Libya)	3
[iv	omitted]	...
v	Sais	4
vi	Xois	7
vii	Metelis	5
viii	Heroopolis	6
ix	Busiris	8
[x	omitted]	...
xi	Kabasa	9
xii	Sebennytos	10
	iii Ament	11
	xv Tekh	12
xiii	Ati	13
xiv	Khent-abt	14
	xiii Heqa-ames	15
	vii Khebt	16
	lost	17
xv	Baht	18
	xiv Zef	19
	iv Ka	20
xv	Hu	21
xvi	Hap	22
	vii Khas	23
	xi Merti	24
	ii Kherkher	25
	iv Aq	26
	. . . . Ptah	27
	. . . of Sety	28
	i Pa-mu-ne-pa-pe	29
	lost	30

This list is incomplete, as there is no entry of the xviith, xviiith, xixth, or xxth nomes, either in, or out of, order. It seems evident that the ordinary list has been heavily surcharged with new divisions thrust in at random after the xiith, xiiith, xvth, and xvith nomes.

The grounds for the attribution of some of these new names to definite nomes should be stated here. iii Ament and xv Tekh are well-known nome names. xiii Ati: this is broken, and there is only a line of fluid pouring, and two strokes beneath it; probably it is Ati, the canal of the xiiith nome (de Rougé, *Géographie de la Basse-Egypte*, p. 82). The two strokes of *ti* prevent attributing it to *deb* in the iiird nome (de R. 15). vii Khebt is a name found in the vith nome, but it is more probably the sanctuary of the viith (de R. 40). Baht is the town of the xvth nome (de R. 106); it is not likely to be the canal of the ist (de R. 4) or the port of the vth (de R. 25). Zef is the sanctuary of Haremakhti in the lake of Tanis, xiv (Brugsch, *Dict. Geog.* 988). Ka is probably Hat-ka-ne-Ra of the ivth nome (de R. 23), or it may be the river of the Saite nome (Brugsch, *Dict. Geog.* 811). Hu is in the xvth nome, according to another list at Edfu (Dum. *Geog. Ins.* I, lxvi). Hap is the town in the xvith nome (de R. 113) rather than Hap of the south or north in the ivth or vth nome. Khas is *per khas* in the viith nome (de R. 38). Merti is in the xith nome (de R. 72, see 67). The two fishes, Kherkher, are the canal of the iind nome. Aq is in the ivth nome (de R. 21). Pa-mu-ne-pa-pe . . . is probably "the waters of Pa-penat," which was the domain of Bast in the Memphite nome (de R. 5). *Pena* means a reversal, or change of face, so Pa-penat is probably a sharp bend in the river, and "the waters of Pa-penat" agree to this. Such a bend may be that to west and then to east at Dahshur.

In a supplementary list at Edfu there are four nomes more in xiii Heliopolites, named An, Hotep-hemt, Shen-khebt, and Men-asi. (Dum. *Geog. Ins.* I, lxvi.)

48. We can now proceed to compare this with the later condition of the Delta (Map vi) as shewn by the Revenue Papyrus, Strabo, Pliny, Ptolemy, and the coinage of the nomes. We here rearrange the later lists so as to compare them with the ordinary nome lists, thus seeing what subdivisions of the larger nomes were introduced. See columns K, L in the table pl. vii. The city names are here followed.

	Abydos.	Rev. Pap.	Strabo.	Pliny.	Ptolemy.	Coins.
i	Memphis	x	Memphis	Memphis	Memphis	C
i	Pa-mu-ne-pa-pe	...	...	...	...	...
ii	Letopolis	x	Letopolis	Letopolis	Letouspolis	C
ii	Kherkher		...	...	...	...
iii	(Amu ?) lost	x	Momemphis	...	Libya	C
iii	Ament		...	Mareotis	Mareia	C
iii	...		...	Naucratis	Naukratis	C
iii	...		...	...	Alexandreia	C
iii	...	x	Nitriotis	...	Nitriotai	...
iv	Aq		...	Phthemphu	Taoua	C
iv	Ka	x	Prosopis	Prosopis	Nikiou	C
v	Sapi-meht	x	Sais	Sais	Sais	C
v	...		...	Cabasa	Kabasa	C
vi	...		...	Hermopolis	Hermupolis	...
vi	Ka-khas		...	Xois	Xois	C
vi		x	Gynaikopolis	Gynaecopolis	Andronpolis	C
vii	Nefer-ament	x	Menelaos	Menelaus	Menelaos	C
vii	Khas		...	Metelis	Metelis	C
vii	Khebt		...	Ptenethu	Buto	C
viii	Nefer-abt		...	...	Heroonpolis	...
viii	...		Phagroriopolis	...	...	...
ix	Aty	x	Bousiris	Busiris	Bousiris	C
ix	...		Kynopolis	Cynopolis	...	...
x	...	x	Athribis	Athribis	Athribis	C
x	...	x	Leontopolis	Leontopolis	Leontopolis	C
xi	Ka-heseb					
xi	Merti	x	Pharbaithos	Pharbaethis	Pharbaithos	C
xii	Theb-nuter	x	Sebennytos	Sebennytus	Sebennytos	C
xii	...		...	Onuphis	Onouphis	C
xiii	Heq-ames	x	Helioupolis	Heliopolis	Helioupolis	C
xiii	Ati		...	...	...	...
xiv	Zef	x	Sethroe	Sethrois	Herakleouspolis	C
xiv	...		...	...	...	Pelousion
xiv	Khent-abt	x	Tanis	Tanis	Tanis	C
xv	Tekh		...	...	...	...
xv	Baht		...	...	Panephusis	Neout
xvi	...	x	Mendesion	Mendesium	Thmuis	C
xvi	Hap		...	...	...	...
	...		...	...	...	Diospolis
xvii	Hu		...	...	Pakhnumunis	C
xviii	...	x	Bubastis	Bubastis	Boubastos	C
xx	...	x	...	...	Arabia	C

The reasons for some of these connexions should be noted. iii. Of all the four later divisions of the nome of Amu, that of Momemphis seems to be nearest to the ancient city of Amu. Naukratis is of course an independent foundation. Ament, the west, agrees best to Mareotis. iv Aq is placed in the northern part of the nome, and so corresponds to Phthemphu or Taoua (de R. 20). vi Hermopolis Parva (Damanhur) and Gynaikopolis were both in the Xoite nome (de R. 27). In the viith nome Khebt was Buto (de R. 43), as was Ptenethu (de R. 37). Khas was Metelis (de R. 38), and therefore apparently Menelaus represents the old name Nefer-ament. viii Nefer-abt was Heroopolis, which does not

appear as a nome in Roman times. Phagroriopolis, the "eel city," was near this (Strabo), and therefore in the old Heroopolite nome. xv Baht was the civil name of the capital, Panephusis, the nome being named Neout (de R. 105–6).

49. The nomes of Upper Egypt are a simpler subject than those of the Delta; but there are some results which follow from our study of the development of the Delta nomes, and of the successive periods of the lists. The list A of the corn-figures of Osiris was seen to be the earliest in the Delta, as it was framed before the founding of Memphis. So also in Upper Egypt it is the shortest list, only giving four nomes, v Koptos, viii Abydos, xiv Kousai, and xx Herakleopolis. Brugsch's reading of Elephantine instead of Abydos is very unlikely, as Elephantine is always written as the nome *Ta-kens* in these lists, and not as the town *Abu*. These four nomes of Upper Egypt, with nine of the Delta, make the primitive thirteen divisions of Egypt before the dynasties. (Map i.)

The list B includes Memphis, and is therefore of the earliest dynasties; in Upper Egypt it includes Elephantine.

Lists C and D appear to be contemporary. Koptos is dropped out and Tentyra substituted. The date of this change may be gathered from Khufu being stated to have founded the temple of Tentyra, and the cemetery there beginning about the end of the iiird dynasty. The xth nome appears, but not in the list of Osiris relics. The nome Atf was split into inner and outer, xiii Lykopolis and xiv Kousai. The Fayum was substituted for Herakleopolis. Thus six nomes go with ten of the Delta to make the sixteen nomes of the members of Osiris, Map ii.

The next stage is that of the various other relics of Osiris, later than the primitive list of sixteen, see Map iii. These were in ii Apollinopolis, iii Eileithyiapolis, v Koptos, vii Diospolis, xi Hypsele, xii Hierakonpolis, and xviii Hipponon. The total of the nomes was thus thirteen in Upper Egypt.

After this came the stage of Map iv, the addition of the divisions which had no relics of Osiris, nomes iv, ix, x, xv, xvi, xvii, xix, xxi, and xxii, making up the full religious list of twenty-two nomes. This was probably the condition during the Middle Kingdom or earlier.

50. At a later date (see Map v) a much closer subdivision of the Nile Valley took place. There were not only three nomes above Thebes, but three more *ha* princes, at Hierakonpolis, Latopolis, and Hermonthis. In the list on the temple of Ramessu II at Abydos (Mariette, *Abydos*, ii, 12) there are thirty-six names within the nine upper nomes. And in Ptolemaic times, at Edfu, there is a supplementary list of fourteen extra names within the first eight nomes (Brugsch, *Dict. Geog.* 708).

Ha Princes.	Abydos xix dynasty.	Edfu Supplement.	Coins.	Modern Name.
x	i Abu	(nome)		Elephantine
	Nubyt	Nubti	x	Kom Ombo
	Khennu	...		Silsileh
x	ii Deb	(nome)	x	Edfu
x	Nekhen	Nekhen		Hierakonpolis
x	iii ...	(nome)		Nekheb, El Kab
	Pemer	Mer-ut		Kom Mareh (B.D.G. 1186)
x	Any	Per-bennu	x	Latopolis, Esneh
	Agni	Akhent		?
	Hat-snofru	...		?
	Heft	Hef		Tuphium ?
	...	Hasfin		Asphynis, Asfun
	Ant	Ro-ant		Gebeleyn
	Aa-mater	...		?
	iv Zerti	...		Taoud
x	Ani	Annu-res	x	Erment
x	Uast	(nome)	x	Thebes
	Maad	...		Kom Madu, Medamot
	v Qesi	Qest		Qus
	Nubt	...		Tukh
x	Qubti	(nome)	x	Quft
	Ha-si-ast	...		?
	vi ...	Nuterkhet		Tentyra (part)
x	Ant	(nome)	x	Tentyra
	Nebut	...		?
	vii Seshesht	(nome)		?
	Pe-bennu	...		Tabenna
	Pe-zaza	...		Diospolis, Hu
	...	Ateb		?
	...	Samhudti		Samhud
	viii Gerg (Ram. II)	...		Girgeh
	Abdu	Hat-asar		Abydos
x	Theni	(nome)	x	Thinis
	Nesh	...		Menshieh
	ix Apu	...	x	Panopolis

Hat-urt-Amenemhat

These lists unfortunately break off here, and the coins only give Antaiopolis, between the xth and xith nomes, as supplementary to the standard nome list. We see how far more closely the country was divided in the south, after the early times, and probably if we

had similar lists for Middle Egypt there would be more than eighty nomes in Upper Egypt, or about 120 nomes including the Delta. Roman Egypt is treated (in Map vi) as it was in the Delta map. The Thebaid, from Hermopolis up, seems to have been regarded as a single division, in the Revenue Papyrus and Strabo. The towns which he names are given in the table pl. vii as towns, where not stated by other writers as nomes.

51. We now turn to the relics of Osiris, separated into those belonging to the earlier and later nomes, with the numbers of the nomes in the Delta (D) and Upper Egypt (U). (For sources see Dümichen, *Geog. Ins.* III, i, xliii–liii; Lanzone, *Dict. Mit.* 697–702; de Rougé, *Géog. Basse-Egypte.*)

Earlier.		Later.	
viii U, i D	head		...
	...	xix D	eyebrows
iv D	eye	xx D	L. eye amulet
	...	xi D	ear
v D	ear		...
	...	iii U, ix D	jaws
	...		
	...	ii D	neck
xx U	arm		...
	...	viii D	skin?
	...	vii D	shoulders
x D	heart	v U	arteries?
xv D	*khu*-heart		...
xiii U	lungs		...
xiv U	liver		...
	...	xi U	stomach
	...	xii U	intestines
	...	xviii U, vi D	liquids
	...		
	...	ii U	torso
ix D	spine	xvi D	spine
	...	vii U, xvi D	phallus
	...		
xiii D	thigh-bone	xii D	shin-bones
vi U, iii D	R. leg		...
i U	L. leg	xxi U	leg
xviii D	leg		

Here it will be seen how the earlier nomes comprise the whole of the body; while the later nomes only claimed duplicate relics, or parts which were not at first regarded as separate.

The duplication of the head in the earlier nomes is obviously political. Abydos had the head at first, it was "the hill of the head." When Memphis was founded by Menes, the greatest of relics was naturally transferred to the new capital. The confusion of three or four relics of the leg is doubtless due to the foot and leg not being distinguished in hieroglyphs. We should note that the relic of Koptos is called *Qeb* with the heart determinative; as *qeb* means duplication, or arm, it suggests the large arteries of the heart. The relic of Heroopolis was called *Tem* (de R. 56), and was probably *tem*, the skin. The *beqes* or *beseq* of Busiris is unknown, but the other list gives the spine.

We have now reviewed the nomes, from the simplest list which descended from a time when Memphis was yet unknown, down to the full development under the xixth dynasty, which was continued on to Roman times.

52. The maps here given are solely to illustrate the divisions of the land. The sites which are known are marked with circles, but where the exact spot is unknown the name is put across the district where it is believed to be. We have carefully refrained here from all discussions of precise sites, as that is a very large and intricate subject. The most likely sites have been adopted, in view of de Rougé's discussion and Ptolemy's Geography, but in some cases a doubt still remains about them. For our purpose the precise site is a secondary matter, as we are here only considering the divisions of the land. The lines of river here marked are the present ones, so far as Ptolemy shews them to have been in use in Roman times. Some short necessary connexions have been made in accordance with Ptolemy. The lines not defined by Ptolemy are omitted. Doubtless the courses have all changed to some extent, but we cannot restore them by mere conjecture. The circles of towns are inserted the same throughout the maps, for the sake of identification; but where no names or numbers are applied to them, we have no evidence that they were nome capitals at the period. For brevity the name of the nome capital is put instead of that of the nome. The Greek names are retained throughout where known, in order to enable the maps to be easily compared together, though of course they are anachronisms in the earlier periods.

53. Regarding the periods assigned to the different maps, they are only approximate, but are stated in order to give a general idea of the age when the divisions were in existence. The actual instances of the isolated mentions of nomes shew that, while

Map iii may have been the state at the beginning of the Old Kingdom, some of the other nomes appear during that age. We find between the iiird and vith dynasties—

Delta ii (L.D. II, 3; M.M.D. 3.)
iii (L.D. II, 3; 34.)
v (L.D. II, 3.)
vi ? (L.D. II, 5; 27, *Khas-ament.*)
vii (L.D. II, 3; Sebek was worshipped in the Delta in three nomes; iii and iv were western; only vii could be eastern as stated.)
viii (L.D. II, 3. This *nefer* nome would appear more likely to be vii, but that seems to be already specified as *sebek.*)
ix (Maspero, *Etudes Egyptologiques*, 248.)
x–xii (L.D. II, 3, 5; only the bull without distinctions. Other instances are the bull with *heseb* (?), xi nome, in M.M.G. *e*; and the bull with two feathers in M.M.D. 5, which is otherwise unknown.)
xvi (L.D. II, 3, 5.)
Upper iii (D.G. 3, 17; Gebrawi.)
v ?? (M.M.B. 14; this may only be Horus.)
x (M.M.D. 11; Brit. Mus. 1223.)
xii (D.G. 17, 18; Gebrawi.)
xiv (Ann. Serv. II, 258; III, 252.)
xv (L.D. II, 112 *b*; 113, *b*, *c.*)
xvi (L.D. II, 110 *h.*)
xix (M.M.A. 2.)
xx (P. Deshasheh, xxix.)

These references are collected in the 1st volume of the Studies, M. A. Murray, *Names and Titles of the Old Kingdom.*

54. Other indications, which though very imperfect, yet are valuable for their early age, are those given by the carved slate palettes. The earliest of these with standards seems to be that with the towns. This shews as the attacking parties the Hawk, Lion, Scorpion, and two Hawks. The single hawk is probably that of the iind nome of Upper Egypt (Edfu); the two hawks are certainly the standard of the vth nome (Koptos); the lion and scorpion tribes do not seem to have localised their standards later. The next slate in style is that with the bull and enemy, on the top. The standards are two Jackals, Ibis, Hawk, and Min sign; these represent, in Upper Egypt, the xiiith nome (Asyut), the xvth (Hermopolis), the iind (Edfu), and the ixth (Panopolis). The latest slate is that of Nar-Mer, shewing the Hawk, Hawk, Jackal, and piece of flesh; these represent the iind nome (Edfu), the xviiith (Hibeh), the xiiith (Asyut) or xviith (Kynopolis), and the iind nome of Lower Egypt (Letopolis). We can see thus how the conquering league was extending its resources, first only from Edfu to Koptos, next down to Hermopolis, and by the time of Mena down to Letopolis.

55. In the maps of the Delta here there is marked on No. 1 B,B, for two places known as Behut, either of which might be the Sam-behud capital of the xviith nome; the eastern is the more probable. Brugsch names also a town Sam-behud which he places at Tell es Semut, here marked S. In the Map i of Upper Egypt will be seen two sites marked S, of Sam-hudet places in the Koptite region. All of these names are certainly prehistoric, as they shew the towns which were "united to Behudet," the hawk god of Edfu, that is to say the allies of the hawk worshippers in their conquest of Egypt, as the *shemsu Hor.*

In Map v of the Delta it should be observed how nearly all the new divisions (marked by names here) are in the low lands toward the coast. This points to the coast districts not having been fully occupied in the earlier periods; thus we see that the expansion of Egypt took effect in the draining and reclaiming of the lower marshes. The extra names were not so much due to a subdivision of government, as to the creation of fresh centres of cultivation.

A general feature is that the nome capitals are usually at the forking of the branches of the river, often close together but parted by the stream. Such are iv and v, ix and xii, xiv and xv, xviii and xx, ii and xiii. This shews that the rivers were the boundaries of nome territories, and that we should not usually expect to find nomes extending across a river. These positions of the river must be ancient, as two capitals would not be placed so near together unless there lay a river between them.

In Map vi of Upper Egypt the Phaturite nome is not placed at Thebes as usual, because Pliny (who alone names it) gives also Hermonthis, Thebes, and Koptos, leaving no room for it in that region. It may perhaps not represent *Pa-ta-res*, "the south land," as a name of the Thebaid, but rather *Pa-ta-rut*, "the fresh or green land," now Derut where the land is made green by the Bahr Yusuf branching from the Nile.

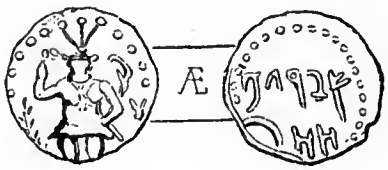
THE ISLAND OF BESA.

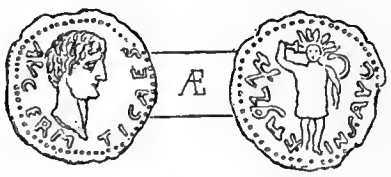
By W. M. FLINDERS PETRIE.

56. THE coins of Iviça, the Roman Ebusus, are well known. They bear on one side, or both, a full-faced figure of a god holding serpents. As the inscription is in Phoenician, the god has been termed Baal by the numismatists. But it is perfectly plain that he is the god known to the Egyptians as Bes or Besa. He has the diverging feathers on the head, the broad face and beard, the hand on the hip, the short thigh, and the bent legs, which are all familiar in figures of this god.

The inscription gives the name of the island in Phoenician as AIBSA. Ai is the regular Semitic for island, and the name thus is "the island of Besa." The classical forms of Ebousos and Ebusus, are as near as such transcriptions usually attain ; and the modern Iviça is even nearer to the original, when we remember that the *beth* was a *v*, and the Spanish does not distinguish *b* from *v* now.

57. Bes was originally of African origin, and was brought up the Red Sea into Egypt from Ta-neter, or Punt. Hence we cannot suppose that he came from Iviça originally. The name must have been given by the Phoenician traders, though there is no evidence for a worship of Bes in Phoenicia. Is it possible that there was a fusion of the dwarf Ptah and Bes? They were similar in deformity, and the dwarf Ptah was carried on the prows of the Phoenician triremes, as Herodotos states (iii, 37). These figures were certainly of Ptah, as they were "the Phoenician Pataiki," which is clearly the same root as Ptah. But possibly Bes was worshipped as a variant of this type.





The figures on the coins are a late variety of the god. In early times and down to the xviiith dynasty the pendent tail is shewn; but in the xxvith dynasty and Roman times the tail is omitted very generally, as on the coins. He is sometimes shewn holding serpents in Egypt, though this was not his usual type. The abundance of Egyptian amulets and scarabs of the xxvith dynasty found in Sardinia shews that it is in this age that the connexion of Bes with Iviça is most probable.

THE ROMAN COINAGE OF ALEXANDRIA.

By J. G. MILNE.

58. *The Nature of the Currency.* During the last few years several hoards of tetradrachms struck at Alexandria under the Roman emperors, have come into my hands from different sources in Egypt: and the statistics as to the composition of these hoards which I have been able to collect provide some material of interest as bearing on the activity of the Alexandrian mint at different periods.

It should be premised that, from the time of the conquest of Egypt by Augustus to the monetary reform of Diocletian, the tetradrachm was the most important coin ordinarily circulating in Egypt. It was nominally of silver, but actually very debased: the earliest examples struck under Roman rule, in 21 A.D., contain about 50 per cent. of silver ; the latest in 296 A.D., less than 1 per cent. The

deterioration in fineness, which proceeded at varying rates through this period, was associated with a diminution in size and weight: the first coins are about 1 inch in diameter and weigh on an average about 180 grains—the last about ¾ inch and 90 grains. No other silver, or nominal silver, was struck at Alexandria, except for an issue of didrachms under Claudius, which are extremely rare: and no external silver coinage circulated in the country. A certain amount of Roman gold was brought in, but was probably used mainly by the Roman officials: there is no trace of its occurrence in the records of ordinary commercial transactions. Bronze coins of lower denominations than the tetradrachm were issued regularly till about 180 A.D.: after that date the depreciation of the tetradrachm appears to have caused the abandonment of a bronze currency. In consequence of the importance of the tetradrachm, it was the coin usually hoarded in Egypt: it is rare to find large hoards of bronze, or any considerable admixture of bronze with tetradrachms. And, as the tetradrachms were always dated, bearing the regnal year of the emperor under whom they were issued, these hoards shew, not only the approximate date when they were formed, but also what length of time coins remained in circulation.

59. *The Hoards.* The following brief description of the hoards included in the tables, will serve at the same time to indicate certain points which affect their value for statistical purposes.

Hoards i, ii, and iv were found in the Fayum by Messrs. Hogarth, Grenfell, and Hunt in 1895-6—the two first at Umm-el-Atl, the other at Kom Ushim. I contributed an account of the coins to the volume on *Fayum Towns* published by the Graeco-Roman Branch of the Egypt Exploration Fund in 1900 (see pp. 64 ff.). These three hoards are the only ones of which I can say with certainty that they reached me just as they were found, without any loss or addition.

Hoards iii, v, vi, vii, and viii were obtained by Messrs. Currelly and Frost at Tell-el-Maskhuta in 1905. These five are probably "uncontaminated": they were purchased from the native finders, without the intervention of any dealers, and there was every appearance, in the condition of the coins, that those in each lot had been found together. It is possible that any one of the lots may only be a part of an original hoard, since, if a discovery of coins were made, and more than one man was aware of it, the find would probably be divided; but the division would take the form of a haphazard separation of the whole into shares without any selection of individual coins, so that the ratio of the numbers of coins belonging to different years would not be seriously affected in the respective parts as compared with the entire hoard.

Hoard xiv I purchased in Cairo from an Arab dealer: it was originally in two lots. I described this hoard in the *Archiv für Papyrusforschung*, ii, p. 529, where my reasons for treating the two lots together may be found. So far as I could judge, this hoard was practically "uncontaminated."

The remaining six hoards have come to me through Signor Dattari of Cairo; and, as they have passed through several hands, and have lost most of their history, I cannot feel at all certain how far the coins which reached me represent what were originally found. In no case, except that of hoard x, was there any internal evidence of confusion: the coins were, in each instance, in generally similar conditions of preservation, and ran in fairly even distribution; but, as the former holders of the hoards may have chosen out some specimens of the rarer types, such diminution of the numbers by selection would decrease the value of the results derived from them for statistical purposes. Hoard x appeared to have been made up from two distinct lots: the coins of the first and second centuries in it may have belonged to one lot, and in fact, when they reached me, there were many instances in which coins ranging from Claudius to Commodus were corroded together; but I did not find any third-century coins united to any of an earlier date.

In spite of this possibility of "contamination," the total number of coins of each year found is of considerable interest, as shewing the relative sizes of the issues in different years; though the comparison can only be made, with any degree of fairness, between neighbouring years which are covered by an equal number of hoards.

60. *Variations in Minting.* I had hoped that it would be possible to carry the comparison further, and, by determining the rate of wastage, to construct a table shewing the original proportion of the coinage belonging to each year. But, after a careful examination of the statistics with Professor Petrie, I conclude that the present evidence is insufficient for this purpose, though some approximate results may be obtained. The chief difficulties are set forth in the following paragraphs.

It is fairly clear that, during the first two centuries

of our era, there was nothing like a uniform rate of coinage of tetradrachms at Alexandria. None were issued from the time of the Roman conquest, in 30 B.C., till 20 A.D.; a few were struck under Tiberius, but mysteriously disappeared from circulation: then, in the second to the sixth years of Claudius, fairly large numbers appeared, and again, after a lapse of ten years, in the third to the sixth years of Nero; two years followed without any silver coinage, and then, after a very small issue in the ninth year of Nero, came an enormous activity of the mint, which died away eight years later in the third year of Vespasian. In the following thirty years there are only seven of which any tetradrachms are known, and the issues of all but two of these years must have been small, as specimens are rare. Thereafter, for seventy years, we find examples dated in every year except two; then comes another gap of ten years, broken by one issue only; then, during the thirteen years of the sole reign of Commodus, there are coins of every year, and in some cases large numbers are found. In the reigns of Septimius Severus and his sons, covering a quarter of a century, tetradrachms occur belonging to most years, but in all instances they are extremely rare, and very few can have been struck. With the second year of Elagabalus fairly large issues begin once more, and thereafter, till the reform of the coinage under Diocletian in 296, there was a mintage of every year, except 251–2 and 252–3, though the number of coins put into circulation must have varied considerably from year to year.

61. *Wastage of Currency.* As no uniform rate can be postulated, the alternative way of defining the wastage would be to compare several hoards covering a fairly long period, but ending at different points during the period. The hoards described here, however, do not give very good data for this purpose; and, so far as I can ascertain, the majority of similar hoards found in Egypt share the same characteristics. That is, most of them seem to have been buried within certain very limited periods: the coins found in hoards usually end with the middle of the reign of Marcus Aurelius, the early years of Aurelian, or the end of the issues of Diocletian. These dates mark lines of general disturbance in Egypt—the "Bucolic war" and revolt of Avidius Cassius, the Palmyrene invasion, and the usurpation of Domitius—when it would naturally occur that large quantities of treasure would be buried, part of which the owners would never return to recover. But this narrow limitation of the hoarding periods is unfortunate for our present purposes.

It happens that these times of disturbance were almost coincident with times of debasement of the coinage—there may indeed have been some causal connexion between the two. The size and fineness of the Alexandrian tetradrachm persistently diminished under Roman rule; but the most sudden and marked depreciations were at the end of the reign of Marcus Aurelius and in the tenth year of Gallienus, while the issue of tetradrachms ceased entirely during the revolt of Domitius. A man hoarding coins would probably select, from amongst those that came into his hands, the specimens of most intrinsic value, and keep these, passing back into circulation baser pieces which were nominally worth as much. Hence any hoards formed shortly after a sudden depreciation of the coinage would tend to be composed mainly of the older issues, to the exclusion of the new; and thus the composition of such a hoard would not be a fair index of the actual circulation at the time of its formation.

It is, however, possible to obtain from these statistics some evidence as regards wastage during the years from 230 to 280 A.D. Professor Petrie has kindly investigated the six hoards which cover the greater part of this half-century, and finds that the period of half-waste lies between 15 and 22 years, the mean being 18 years. Taking this result, he states the following as the proportions of the original issues left in successive five-year groups:—

After	5 years	82·46	per cent.
„	10 „	67·8	„
„	15 „	56·	„
„	20 „	46·	„
„	25 „	37·9	„
„	30 „	31·2	„
„	35 „	25·7	„
„	40 „	21·2	„
„	45 „	17·5	„
„	50 „	14·4	„
„	55 „	11·8	„
„	60 „	9·8	„
„	90 „	3·05	„
„	100 „	2·	„

But, while this rate of wastage seems reasonable within the period from which it is calculated, it does not suit the figures of the first century. If the wastage of the coinage of Nero had been at this rate, the issues of his later years would appear

to have been almost incredibly large: thus, in hoard ii, buried after 165 A.D., out of 4344 coins, 2380 belong to the years 63 to 68; and yet, according to the wastage table, only one-fiftieth of the original coinage of these years should have been in circulation when the hoard was buried. That the number of coins of Nero present in this hoard is not an isolated accident, due to some such cause as the man who formed it having come on an earlier hoard, is shewn by the approximately similar proportion of these coins in other hoards covering the same period. Some explanation may be found in the probable tendency, noted above, to reserve the oldest and best coins for a hoard. But it is most likely that the wastage of tetradrachms in the first century was actually less than in the third: for one thing, the earlier coins were larger, which would make them less liable to casual loss than the smaller later ones; also, in the first century there was a considerable amount of bronze currency in circulation, whereas in the third the tetradrachm was the chief medium of exchange, and was the only official coin issued, so that the comparative liability of waste of the later tetradrachms would be much greater. That tetradrachms were actually lost more frequently during the third century than during the first appears from the statistics of the coins found in the excavations of Drs. Grenfell and Hunt at Oxyrhynchus, which I gave in the *Numismatic Chronicle* (1908, p. 303). These coins all came from the rubbish-mounds of the ancient town, and represent the ordinary losses of daily life; and the summaries for the three centuries are:—

First century	.	11	tetradrachms	80	bronze
Second „	.	8	„	104	„
Third „	.	307	„	5	„

So far, therefore, as wastage is determined by casual loss, the wastage of the third-century tetradrachms would appear to have been far greater than that of the first. There are, of course, many other factors in wastage; but it is fairly clear that the rate discovered for the third century cannot be taken as even approximately applicable for the first; and it remains for further evidence to be adduced in order to shew how fast the first-century tetradrachms wasted.

62. *Irregularities of Hoarding.* In the comparison of the issues of different years, the totals of several hoards are a safer guide than any single hoard, as the proportions in any individual case may be affected by accidental circumstances. For instance, in hoard xv, the figures are certainly abnormal at two points. The man who collected this hoard seems to have had a special fondness for the coins issued jointly by Aurelian and Vaballathus, or by Vaballathus alone,—possibly he was a Palmyrene,—and he accumulated 262 of these, thus swelling the proportionate numbers for the first and second years of Aurelian in his hoard far beyond those of any other. Then, in the eighth year of Diocletian, he seems to have secured a consignment of coins fresh from the mint, and to have put them away promptly: the evidence for this is that a large number of the specimens of this year in the hoard are quite unworn, and further present several instances of fairly long series of coins struck from the same dies; among the 117 examples of this date, there are series of 12, 16, 18, and 22 coins from the same obverse and reverse dies, which would hardly have been found together if they had passed into general circulation; and, if the hoarder added to his deposit in this year a special lot of freshly struck coins, instead of such as casually came into his hands, the result might again be a disturbance of the proportionate total for this year as compared with adjacent ones.

63. *The Billon and Bronze.* There may be similar disturbing factors, not so readily discoverable, in other cases; but, subject to this possibility, the totals given against each year furnish some index to the activity of the Alexandrian mint as regards the issue of tetradrachms. It may be worth while to repeat here two facts which I have previously pointed out (*Fayum Towns*, p. 68): firstly, that when this mint was busy striking tetradrachms, comparatively little bronze was coined; the chief issues of bronze in the first century A.D. were in the reigns of Augustus, Claudius (latter part), Vespasian (latter part), and Domitian, at which periods little or no billon was minted; and in the second century, while there was a steady, but not large, output of billon from the reign of Trajan to that of Marcus Aurelius, there was a very considerable amount of bronze issued; and, secondly, that, as a rule, the larger the coinage of tetradrachms in any year, the smaller was the number of distinct types used. The latter point deserves emphasizing, as an historical argument in regard to the recognition of an emperor at Alexandria has lately been founded on the fact that several different types of his coinage of a particular year are known to exist in different collections, from which it is assumed that he must have issued a large number of coins in

this year and have been recognised for a considerable part of it. This argument is quite unsound, in view of the principle just stated.

64. *The Tables.* It seems desirable to publish these tables, in spite of the imperfect nature of the conclusions, as the material will be of service to any one who can secure more hoards and work them out in a similar manner, especially if thereby the rate of wastage in the first century can be determined and the gap between the second and third centuries be bridged. I have entered all the years from the beginning of the reign of Claudius, whether there are any coins belonging to them or not, for convenience of reference, placing a mark 0 in front of any year of which no tetradrachms are known to exist. I have omitted the earlier years, the 7th, 11th, 14th, and 18th to 23rd inclusive, of Tiberius, when tetradrachms were struck, to save space, as no specimens of any of these years occurred in any of these hoards: indeed, so far as I have observed, and my observation is confirmed by the much wider experience of Signor Dattari, tetradrachms of Tiberius are never found associated in hoards with those of later reigns. The dates are given by regnal years and years A.D., which are not coincident: the regnal years of Roman emperors were reckoned in Egypt on the local kalendar, the year of which began on August 29th; and any fraction of a year from the accession of an emperor to the following August 28th was counted as his first regnal year.

To complete the record, it should be noted that some of the hoards comprised a few coins which are not given in the table, as follows:—

Hoard ii. 2 Ptolemaic; 1 bronze of Antoninus Pius; 75 tetradrachms of Nero of doubtful dates (*i.e.* coins so misstruck that the date, or an essential part of it, is off the flan).

Hoard x. 2 Ptolemaic bronze; 37 illegible tetradrachms.

Hoard xi. 5 Ptolemaic bronze; 31 illegible tedradrachms.

Hoard xii. 78 illegible tetradrachms.

Hoard xiii. 2 Ptolemaic silver; 1 bronze of Claudius; 62 illegible tetradrachms; 20 of doubtful dates.

Hoard xiv. 4 illegible tetradrachms.

Hoard xv. 2 Ptolemaic bronze; 4 illegible tetradrachms.

THE POTTERY KILNS AT MEMPHIS.

By W. M. FLINDERS PETRIE.

65. ABOUT twenty-five years ago, while examining the mounds of Memphis, I noticed the site of the kilns for glazed pottery by Kom Helul, at the south end of the ruins (see map *Memphis I*, pl. i). I mentioned them to a friend; and that unhappily resulted in the site being plundered by another person who had no interest in the technical questions to be studied, and who merely looted for specimens, which have not yet been published. So soon as Memphis was in my hands I began excavation there, Mr. Wainwright directing the men; we cleared out a kiln containing wasters, and published the results in *Memphis I*, pp. 14, 15; pls. xlix, l. This year Mr. Bushe-Fox was wishing to work on the Roman period, and so we cleared over the whole site of the kilns. Naturally very few good specimens were found, owing to the previous looting. We secured a great variety of fabrics, which were probably all made about the same period, and serve to shew the contemporary types. No coins were found; but the ɔc curves of the lamps (pl. xiv) begin in the Julian period, so that we cannot put the site before late Ptolemaic times, and it probably continued in use over the beginning of the Roman age. If we date it to the 1st cent. B.C., that probably covers the period of manufacture here.

The kilns all lie square one with another; six of them are within a space of 60 to 70 feet, but, as no roadways were found, it is hardly of use to give the plan here, in addition to the dimensions. The forms are all square, with vertical sides.

Kiln	i	ii	iii	iv	v	vi
Out N–S	145	(walls 18 to 21 inches)				
E–W	155					
In N–S	83	50	42		57	46
E–W	79	69	52	50	66	42
Depth now	121	133	133	146	187	60
Draught-hole	W	?	?	?	W	N

They were apparently half sunk in the ground when built. The draught-hole, or stoke-hole (view in *Memphis I*, pl. xlix), was more than half-way up in i, 34 inches from the top in v, and about half-way up in vi. It is 19 inches wide in i, 10 inches in v, 17 inches in vi, where it has been subsequently blocked up so as to leave only a hole 7 inches wide and 5 high. The walls of the kiln below the stoke-hole are deeply burnt; but they are not generally slagged below the hole, and never down to the bottom; above the stoke-hole the slag is thick upon the sides.

How, then, were these kilns used, without any trace of a perforated floor to support the pottery? In the modern Egyptian potter's kiln the large firing chamber is fed from an opening in the lower part; and above that a brick floor, with many holes, supports the pottery in the upper part of the kiln. The only conclusion possible here seems to be that the saggars, containing the pots to be glazed, were stacked in tall piles in the kiln; that then the fuel was thrown in between the piles and burnt. The heat below the stoke-hole was a slow combustion, not violent enough to fuse the brickwork; while from the stoke-hole upwards the air supply was strong enough to raise the heat to slagging point. It may be that the lesser heat below was intentionally arranged, by means of putting the stoke-hole half-way up, because the saggars in a full heat would not bear the weight of a whole stack ten feet high. Thus the greatest heat was only allowed to play on them where the weight of the pile was less. Such seems to be the only explanation of the results which we find here.

66. The fuel used was straw; we found much carbonised straw in the masses of slag, which had run down and covered it. No trace of sticks or of charcoal was found.

The pottery to be glazed was stacked in saggars (pl. xix, 239) of cylindrical form. Two were found unused, 8 and 8½ inches wide, 5½ and 6 inches high. The largest sizes among the fragments of used saggars are 30 inches across and 8 high, another 19 inches across. The height was almost the same, whatever the diameter might be, because its limit was the height of the internal stack of glazed dishes, which would not yield to their own pressure at the fluxing temperature. The saggar fragments are flushed over with glaze and slag, which has run down, and through the cracks, and hung as drops on the under side of the flat bottoms. The pieces with parts of dishes stuck in them are shewn in figs. 233–235.

The glazed pottery in the saggars was first supported on three-pointed stands, figs. 236–238. These vary from 3¼ to 9½ inches across, and from 2½ to 4 inches high. The dish which was first put inverted on the stand in a saggar, had then three or four little cones of pottery (fig. 212) stuck on to its base ring with a dab of soft clay to bed them (figs. 213–216). Upon the points of these cones was placed the next dish, which then had similar cones set up on it. This stacking was continued until the saggar was filled, when another saggar was put upon the top, ready to be charged. These cones are smaller in the Ptolemaic time (the top row of 212), as found in the waste high up on the Kom el Qalama (*Mem. I*, pl. i). The larger ones (lower rows) are those from the Kom Helul, of the 1st cent. B.C.

The saggars having been stacked and filled, it was needful to lute them to keep out the furnace gases. Strips of clay were handed to the workman in the kiln, who pressed them into the cracks between the saggars, and threw away the waste ends of the strips, which were then accidentally fired in the kiln (fig. 230). The junctions of the saggars, as seen on some of the fragments, were smoothly wiped round to close the union. This use of the clay strips is shewn by the impression of a junction of saggars upon one of the pieces; these scraps are ·6 to ·8 inch thick and 5 inches long.

With the potter's waste there were, from the Ptolemaic site, several pointed pieces of hard wood (fig. 250), and some of bone (251). These may have been for modelling tools. Some moulds were also found, such as the pottery moulds of the seated Horus (240), and the ushabti (241), and the moulds of plaster for lamps (242–244), Horus (245), a leg of a figure (246), and a goose's head (247). The little pottery mould of Cupid (248) was doubtless for the affix at the base of a handle, on the side of a jar. For the other numbers on this plate see *Meydum and Memphis*, pp. 41, 43.

67. The preparation of the blue colour which was used for the glaze was also carried on at Memphis. The process in its details was traced out by me, from the factories at Tell el Amarna (*Amarna*, p. 25, pl. xiii), and experimentally repeated by Dr. Russell (*Medum*, p. 44). The colour required a long roasting at a heat below fusing point, and the careful exclusion of furnace gases during this process. For this roasting, the frit colour was made up into balls or pills: these are of two sizes, the larger 1·2 inch diameter, see the example in fig. 232; the smaller ·3 inch diameter are more usual, see fig. 231. These pills were then placed

in egg-shaped jars of large size, ·3 inch to 1 inch thick, 10 to 12 inches wide, and at least 20 inches high, or more probably 24 inches. The jars had a flat base 6 inches across, and a mouth 3½ inches wide with a broad flat lip. The mouth of the jar was closed by a flat pad of infusible clay and sand; and it was then set, mouth down, on the base of another jar, and clay wiped round the junction to lute them together. It was essential for the frit to be kept free of iron, which would turn the blue to green if it combined with it. To protect the pills a lining of blue frit was therefore put into the jars, ·15 to ·35 inch thick; and this lining, though discoloured from half to three-quarters through, was thick enough not to alter throughout during the heating. The pieces of frit jar are thus lined with the most brilliant blue coating, which makes them conspicuous on the rubbish mounds.

68. We now turn to the varieties of glazed ware which was made here; and, unless exception is stated, the specimens are from the Helul factory of the 1st cent. B.C.

Pl. xiii. The numbers here refer to the consecutive numbers of the fragments on the following plates. The whole vase and bowl are restorations from the pieces, to give an idea of the appearance of the forms when complete. The fragments here are probably of the Ptolemaic age, and most of them were not found at Kom Helul, where the wasters are all of the coarser wares.

Pl. xiv. 1–24 are pieces of lamps with the ɔc spout, which began in the Julian age, and may have lasted in brown pottery down to about 200 A.D. (*Mem. I*, pl. xlvii). These are probably not later than Augustus, as no such glazed lamps were in use at 50 A.D. (*Meydum and Memphis*, pl. xl); and they probably preceded the rougher pottery ones which were then made. The colouring is plain blue on moulded relief, from 1 to 12; and with the addition of lumpy yellow spots on the handles, 13 to 24. These shew how early the use of yellow slip spots arose, which are so common on Roman glazed figures.

The pieces 25–43 are of full blue glazing, over reliefs, the hollows of which are filled with black. They are apparently all pieces of jars like that restored on pl. xiii.

Pl. xv. These are all of plain blue upon relief moulding. 54 shews part of an animal. 55 bears a bold wreath of parallel sprays. 56 is part of a bowl, restored on pl. xiii. 59–72 are pieces of jars with animals of coarse work, and rather dry glazing, like *Mem. I*, l, 15. The lips on that plate, 9, 10, 11, shew the form of the pieces 74 and 75. 76–81 are pieces of large thin jars with a bold spray pattern.

Pl. xvi. These are all high-modelled reliefs of animals. 82, 84, and 85 have green glaze over purple details. 83 shews a donkey bearing water-jars, in purple relief on light blue. 87 is a plain green-blue *uza* eye. 88–98 are of plain Prussian blue, dark in tint, verging sometimes toward indigo. 93, 99–110 have a yellow-green colouring, with rich Prussian blue coating over it, running dark in the hollows. 111–123 are similar, but with a purple-blue covering. This combination of dark blue over yellow-green is the richest colouring of any found here.

Pl. xvii. 124–145 are all of manganese purple, rather light, upon a white ground. That this white is not merely decomposed blue is shewn by 137, 139, and some others, which have a light blue lining, unaltered and in perfect condition; thus the pieces have not been exposed to damp, or other influences, which would bleach the blues. 146 is blue over a relief surface, as also are 148–153, except 150, which is blue on black, like 154–159. 160 and 161 are greeny blue on relief.

Pl. xviii. 162, 163, 172 are white with the hollows brown, which looks like an original colour, and not decomposed. Probably it is a manganese colour. The small pieces with fine decoration, 165–190, do not photograph clearly, and therefore the more important are given in coloured hand copies on pl. xiii, with the same numbers. These were from various sites at Memphis. Some numbers are repeated here, where both sides of the same fragment are shewn. The pieces 191–195, 197–203 are reliefs, mostly green on white, like the pieces in *Mem. II*, xxvii, 33, which have been very successfully restored in the Ashmolean Museum. 196, 201–211 are pieces of white relief with dark brown ground, evidently manganese colour as it runs toward purple. 204 and 205 are parts of wings from a figure.

Pl. xix. The large blue glazed heart, 218, was the only perfect object found at Kom Helul; it had been thrown aside because of a slight adherence on one face; it is now in the Cairo Museum. The brown pottery lamp with Bes and his consort, and the relief head, 220, were found in the high waste of Kom el Qalama. 221 is a piece of a glazed vase, shewing the cast of the core of coiled straw, on which it was modelled. 222–225 are forms of glazed

necks, and 226–229 handles. All the other numbers on this and the next plate have been described in the account of the manufacture.

69. Lastly, an interesting matter remains to be considered, regarding the sources of this school of glazed ware. The lamps, pl. xiv, are manifestly Graeco-Roman in origin; and the usual late Greek design is seen in the scroll sprays, as on 43, 76–81, and 170. Some Egyptian influence appears in the lotus cup, xiii, 56, and lotus bases, 29–32. The wave borders 2, 35, 162–164 may be claimed as Greek, though the pattern is also Egyptian and Assyrian. But for the most part these designs are from oriental rather than western sources. The dragons on the bowl 170 (xiii), on the pieces 171, 179 (xiii), and with the sacred tree on 172 (xviii), are Persian or Assyrian in origin. The animals on pieces 63, 68, 89, 98, 116, 117, 122 are all Persian rather than western. The plants on 88, 90, 137 shew the same influence. Whence comes this Persian influence in the 1st century B.C.? It is a long interval since Persia gave the law to Egypt, some three or four centuries before. Yet we also find Persian art dominating Coptic design some six centuries later. Was there a continuity of the Persian school in Egypt? Or, were the artists in glazed ware brought from Persia, to carry on the manufacture, as that country was the special home of glazed decoration? We require to know more of the arts in the intervening centuries, and more of the glazing done on other sites, before we can answer these questions. The collection of glaze and technical specimens of manufacture has been arranged in series for the British Museum (glass department), Manchester, Oxford, Cambridge, Carlsberg, Brussels, Boston, Philadelphia, and Toronto.

LINEN OF THE IIIRD DYNASTY.

By W. W. MIDGLEY.
(BOLTON MUSEUM.)

70. THE following investigations were made of the body-wrappings taken from a small cemetery, about a mile north of the pyramid of Meydum, in Upper Egypt, in the year 1910. The period to which they belong is the late iiird or early ivth dynasty.

So little is known about the details of construction, or the fibres, of textiles of these early times, that I have been invited to undertake their examination and report upon them to Professor Flinders Petrie.

After dividing the examples of cloth submitted into nine kinds, each has been examined to ascertain, A, the number of "ends" (warp threads), and of "picks" (weft threads), per linear inch; and a micro-slide of the cloth was mounted to identify it with the bulk; B, any peculiarity in the yarns, and to fix, approximately, the "counts" (the number of hanks in a pound); and, C, the micro-measurements of the diameter of the fibres composing both the warp and weft, giving the extreme range and mean of eight fibres. Each cloth is alphabetically marked in capitals; and a micro-slide was prepared for reference, with each preparation marked in small letters, thus "A^a," "A^b," "A^c," etc.

In arriving at the "counts" I was governed by that of similar modern yarns. The "ends" and "picks" were ascertained from the mounted slides of cloth, by means of a micro-objective having a "field" exactly 0·25 of an inch. The diameters of fibres were measured with an eye-piece micrometer, using an objective which gives a value of $\frac{1}{5000}$ inch to each division.

71. Cloth A^a (largest, light-coloured piece).

i. Mounted a bit of the cloth (about 1 inch × $\frac{3}{8}$) under cover-glass marked "A." With silver-side reflector found this to be a "regular" woven fabric: the surface of the yarn has a good quantity of granular matter deposited upon it. There are in the warp 48 "ends" per inch, and in the weft 80 "picks" per inch. The "counts" of the yarns are (approximately)—in the warps (which to my surprise are *doubled*) equivalent to 18*s* modern yarns; and in the weft about 24*s*, the latter varying more in diameter than does the warp. No attempt made to count the number of fibres composing a cross-section, owing to their brittle condition.

ii. A^b. Prepared a slide shewing four strands of warp at one end, and four strands of weft at the other. Examined with S.S. reflector, transmitted light, and

afterwards dark-ground illumination. This revealed unmistakably that the warp is a "doubled" one, while the weft is single yarn.

iii. A^c. Teased out the twist from the yarns of the warp, and arranged the fibres at one end of the slide, and afterwards did the same with some weft, placing them at the other end, for the purpose of identifying the particulars of the fibre. Both yarns are spun from flax, the only difference being that in the warp the fibres have been more effectually separated, and consequently shew a less mean diameter. It is remarkable that, after the lapse of more than five thousand years, the individual fibres should retain the peculiar characteristics of flax—the curious bamboo-structure across its cell-walls. In order that the diameter of these fibres may be compared with recent linen fibre I took micro-measurements of ten of them: the warp ranged from $\frac{1}{800}$ inch to $\frac{1}{1000}$, with an average of $\frac{1}{1650}$ inch, and the weft ranged from $\frac{1}{2500}$ to $\frac{1}{850}$, with an average of $\frac{1}{1250}$ inch. As will be noticed in the prepared slide of fibres (A^c) for ascertaining the diameter, it was no use measuring the *length* of them, as upon separation they all became more or less broken.

I failed to discover any woven selvedge. In the cloth "A" there was, however, what might appear a selvedge, but I found it to be a frayed edge hemmed down with linen thread of three-ply make.

B^a. Linen fibre. Coarse plain weaving: warp doubled, weft single. The fabric was weaker, and considerably more stained with the preservatives used in burial than sample A. There are 16 "ends" and 32 "picks" per inch.

B^b. The counts would be approximately 26*s* in the warp, and 20*s* in the weft.

B^c. The diameter of the fibres composing the warp ranged from $\frac{1}{2500}$ to $\frac{1}{1000}$ inch, with a mean of $\frac{1}{1454}$: the weft varied from $\frac{2}{2500}$ to $\frac{1}{1000}$, with a mean of $\frac{1}{1478}$ inch.

C^a. Linen, very stained and the fibres brittle with decomposition. Single warp. There are 20 "ends" and 48 "picks" per inch.

C^b. The counts of the warp would be about 20*s*, and of the weft, about 30*s*.

C^c. The diameter of the fibres in the warp ranged from $\frac{1}{1666}$ to $\frac{1}{1000}$ inch, with a mean of $\frac{1}{1200}$; and in the weft from $\frac{1}{2500}$ to $\frac{1}{1250}$, or a mean of $\frac{1}{1908}$ inch.

D^a. A white linen cloth, much cleaner than the others, and altogether of finer texture: the mean diameter of the fibres in the weft indeed is finer than that of any present-day Irish linen I have measured. There were in this 42 "ends" and 120 "picks" per inch.

D^b. The yarns are very evenly spun and contain a greater proportion of twist than the three preceding cloths. The approximate counts of the warp (a single one) would be 40*s*, and of the weft, about 50*s*.

D^c. The diameter of the fibres of warp ranged from $\frac{1}{2000}$ inch to $\frac{1}{833}$, with a mean of $\frac{1}{1330}$, and wefts from $\frac{1}{2500}$ to $\frac{1}{1250}$, or a mean diameter of only $\frac{1}{1990}$ inch.

E^a. This is a decomposing cloth, and the folds somewhat matted together, making it difficult to investigate the structure. The piece on the micro-slide contains 24 "ends" and 42 "picks" per inch.

E^b. The counts of both warp and weft will be about 24*s*.

E^c. The diameter of fibres in the warp ranged from $\frac{1}{2000}$ inch to $\frac{1}{1000}$, with a mean of $\frac{1}{1230}$, and of the weft from $\frac{1}{2273}$ to $\frac{1}{1321}$, or a mean of $\frac{1}{1666}$ inch.

F^a. This is a linen cloth, dyed dark reddish brown, and consists of a laminated mass about $\frac{1}{2}$ inch thick, 1 inch wide, and 3 inches long; and is so rotten that it will not bear the slightest flexion. Succeeded in mounting a film of the cloth, so as to make out the texture, and found there were 18 "ends" and 52 "picks" per inch.

F$^{b \text{ and } c}$. Separated a few bits of yarn, but uncertain whether these are warp or weft, the counts of which would be about 24*s*. The fibres were so very rotten as to break into small short lengths when touched. However, the characteristic linen fibre was still clear. The diameter ranged from $\frac{1}{1424}$ inch to $\frac{1}{1110}$, with a mean of $\frac{1}{1250}$. Possibly the effect of the fibre having been dyed may account for its more advanced stage of decomposition.

G^a. Regular woven linen cloth, with 20 "ends" and 36 "picks" per inch.

G^b. The warp, a doubled one, is approximately of 20*s* counts, and the weft of 30*s*.

G^c. The diameter of fibres in warp ranged from $\frac{1}{2000}$ inch to $\frac{1}{1330}$, with a mean of $\frac{1}{1400}$, and the weft from $\frac{1}{2500}$ to $\frac{1}{1000}$, or a mean of $\frac{1}{1400}$ inch.

H. This parcel contains a bit of folded cloth to which is attached some strong linen threads. The micro-slide shews four of these threads and some of the fibres teased out. The thread is a hard, twisted, single one, and has apparently been heavily sized. The fibres of which it is composed ranged from $\frac{1}{2000}$ inch to $\frac{1}{1110}$ in diameter, with a mean of $\frac{1}{1430}$ inch.

I[a]. A small piece of coarse linen cloth, with 18 "ends" and 42 "picks" per inch.

I[b]. The warp made of 10*s* and the weft of 16*s* yarn.

I[c]. The diameter of the fibres in the warp ranged from $\frac{1}{2000}$ inch to $\frac{1}{1110}$, with a mean of $\frac{1}{1429}$; and those of the weft from $\frac{1}{1666}$ to $\frac{1}{833}$, with a mean of $\frac{1}{1160}$ inch.

72. *The Photo-micrographs.*

i. Taken to shew the most open texture of the cloths. This is taken from B[a] slide; × 20 diameters.

ii. To shew the closest texture. Photograph from D[a] slide; × 20 diameters.

iii. To shew the difference in the yarns of the same cloths. This shews two warp yarns on B[b] slide, one of which has been slightly ruptured in preparing; × 20 diameters.

iv. Two of the weft yarns from D[b] slide. Notice the evenness of the strands and regularity of the twist; × 20 diameters.

v. To demonstrate the peculiar characteristic of linen fibre; taken from the cloth marked D. Notice the nodal notches at frequent intervals, well brought out on those in focus of the lens; × 150 diameters.

vi. To shew the similarity between the last and the present linen fibres from Irish flax. On comparing the structure of this with v, the only appreciable difference seems to be that in the mummy-cloth the diameter of the fibres is rather finer than Irish flax; × 150 diameters.

Examples v and vi were prepared in pure glycerine, to eliminate diffraction.

AN EGYPTIAN HIPPOCAMPUS.

By M. A. MURRAY.

73. In the City Museum of Gloucester there is a mummy of the xxvith dynasty, presented to the Museum in 1851 by Mr. Edmund Hopkinson of Edgeworth Manor House, Gloucester. The *provenance* is lost. The mummy was enclosed in a cartonnage case (now in a dilapidated condition) and in two wooden coffins. The title and name of the deceased are given on the cartonnage and coffins as *Nef en uya Amen*, *Pedu-Amen*, "Sailor of the boat of Amon, Pedu-Amon."

The outer coffin is in human form, very wide for its length. The necklace is unusually deep, and immediately below it comes a horizontal band with the scene of the Weighing of the Heart. Below the horizontal band are narrow vertical columns inscribed with the Negative Confession. The background is white (now discoloured to a warm grey), the figures are in colours, the hieroglyphs in blue. The space left on each shoulder, between the straight line of the horizontal band and the curve of the necklace, is filled by a kneeling goddess faced by a horse-headed animal (pl. xxi). Isis is on the left shoulder, Nephthys on the right. The greater part of the hippocampus is outlined in black on the white ground of the coffin; the ears, the eye, the nostril, and the mane are indicated in black; round the jaw is a wide black band edged with yellow; the muzzle is yellow with black dots; the wide horizontal stripes on the neck are alternately blue and red edged with black; the three slightly-curved lines below are brown. The dots on the upper side of the tail and the inner part of the curve are black, while the dots and the outline of the lower side of the tail and the outer part of the curve are brown; perhaps with the idea of indicating the light underside of the animal.

74. The inconveniently curved space below the necklace appears to have been always a difficulty to the artists who decorated coffins. It is filled in a variety of ways—generally with inscriptions, or complete scenes. Kneeling figures of Isis and Nephthys are not uncommon, represented leaning forward and holding the disk or *shen*-sign, the head-dress filling the pointed space above, the *shen*-sign partially filling the pointed space at the side. In this coffin, however, there appears a new scheme of decoration, which at once calls to mind the archaic pediments of the early temple of Athena, both in form and colour. In the Athenian pediments, the tail of a monster is used, in precisely the same way as on this Egyptian coffin, to fill an inconveniently pointed space; the tail being undulating, twisted, or curved. In the pediment of the three-headed monster with the twisted tail (Schrader, *Poros Architectur*, pl. iv) the colour is exactly similar to

the red and blue stripes of the Egyptian hippocampus. In the pediment with two serpents (*id. ib.* pl. v), the circular curve of the serpent's tail is very similar to the curve in the tail of the hippocampus. The dotting of the muzzle is like the convention which obtains on archaic Ionian vases to indicate the soft sensitive skin which covers that part of the animal. The striped neck also appears to be derived from an Ionian source. The black band round the jaw, the rest of the head being in outline, may be reminiscent of the Ionian method of representing the whole figure in silhouette, the head alone being outlined in order that the artist might indicate detail. Gems from Melos also occur with the figure of a sea-horse (Furtwängler, *Antike Gemmen*, I, pl. v. 21).

The date of the coffin accords well with the period of the archaic Ionian vases and the archaic Athenian pediments. The Greek connections being so strongly marked, it is evident that the painter was under the influence of Greek art, though the rationalistic treatment of the head is entirely Egyptian and quite unlike the conventionalising method of the Greek artist.

I am indebted to Prof. Ernest Gardner for the identification of the similarities to archaic Greek art in the figure.

FIGURE-VASES IN EGYPT.

By M. A. MURRAY.

75. VASES in the form of human figures and animals occur occasionally in Egypt, from predynastic to Roman times. They are never common at any period, the greater number seeming to be either predynastic or Graeco-Roman. In Pharaonic times, they are found in the Middle Kingdom at Beni Hasan, Dendereh, and Qurneh ; in the New Kingdom at Abydos and its neighbourhood ; but in later dynasties they were more widely scattered.

Arranged according to subject they fall into six classes: A Human beings, B Quadrupeds, C Birds, D Reptiles, E Fishes, F Insects.

A. Of the human forms, by far the greater number are women. Many of these vases present abnormal forms ; the women are steatopygous, deformed, or *enceinte* ; while the vase of the MacGregor Collection shews a male dwarf with deformed arms and legs, and No. 17, though only a torso, shews a man with deformed arms.

The earliest representations of women in any part of the world are either of steatopygous forms or of a normal woman *enceinte*, as in the limestone figures from Naqada and the prehistoric sketch of a woman on bone from the French caves (PIETTE, *L'art pendant l'âge du renne*, pl. xxvii 5). Prof. Petrie suggests that as the steatopygous statuettes belong to the earliest times they may "represent survivals of palaeolithic race" (*Diosp. Parva*, p. 29). This seems the more probable as that particular form of steatopygy appears to be now extinct. We should then have in these figures representations of foreigners or captives, and this idea is borne out by the fact that the vases in the form of men represent dwarfs, deformed people, or captives. Even the vases in the form of the god Bes, which occur in late times, carry on the same idea, for Bes is always represented as a bandy-legged dwarf.

The kneeling position is obviously adopted as being more suited to the form of a jug or vase ; where the figure is standing, either no attempt is made to model the lower part which remains simply as a vase, *e.g.* No. 1, or else the garment falls right down to the feet, *e.g.* No. 65, or, lastly, the body alone is hollow, and the legs are solid (F. P. Coll.).

It seems evident that these figures are intended to represent human beings in an inferior, and even menial, position ; slaves serving their masters, waiting their pleasure, many of them in the humblest attitude.

76. B. Of the quadrupeds, the hedgehog is the favourite. There are several specimens known, ranging from predynastic to xxvith dynasty, the most remarkable being No. 68, said by Prof. J. L. Myres (*El Amrah and Abydos*, pp. 72–75) to be Mykenaean.

The hedgehog (*qunfid* in Arabic) is not uncommon in Egypt to this day. These vases represent the *Erinaceus auritis* which Anderson (*Zoology of Egypt, Mammalia*, pp. 156–159, pl. xxi) describes as being "distributed over the temperate portion of the Palaearctic Region, the whole of the Ethiopian Region, and the western portion of the Oriental Region as far as the peninsula of India proper." One of the chief characteristics of the animal as represented in these vases, is thus described by Anderson : "Ears very large, erect, high above the spines, somewhat pointed, but rounded at their tips, external margins straight or slightly emarginate, height 35 to 38 mm."

Of other animals, there are the calf couchant

No. 69; the lion-cub, which from its position seems intended to be represented as dead, No. 70.

The animal vases also shew a tendency to represent inferior creatures. Of the beasts which have a religious significance—the lion, calf, and hippopotamus—most are immature, and one is even represented as dead. The elephant does not appear in any religious cult, and seems to have been remorselessly hunted out of the country in very early times. The hedgehog was not considered of any great account for food or for religious purposes. The other living creatures are birds, frogs, the crocodile, fish, and the locust, none of which had the same importance as the mammalia, though some, *e.g.* the frog and the crocodile, had a religious significance. The crocodile however was sacred only in certain places; elsewhere it was considered not only inferior but accurst.

77. C. Bird-vases seem generally to occur in predynastic times and in the Middle Kingdom; later they are very rare. The birds, when recognisable, are usually ducks of various kinds, but the pigeon (Nos. 26, 30) is also found. The bird on the nest (No. 15A) appears to be peculiar to Beni Hasan, where several examples were discovered. Of the sacred birds, such as the hawk, I know of only one representation (No. 71).

D. Frogs (*dofdah el moyyeh* in Arabic) are extremely common in Egypt, therefore it is curious to find that frog-vases occur but rarely, and seem to be found only in two places, Naqada and Abydos (PET. *Naq.* pl. xii 82, 83). According to Anderson (*Zool. Eg. Reptilia*, pp. 345–349, pl. L) *Rana Esculenta* and *Rana Mascareniensis* are the two frogs known in Egypt. The former, though apparently rare, seems to be the prototype of No. 73. "It is distributed over Europe . . . Western Asia . . . Afghanistan, Beluchistan, and over Northern Africa from Egypt to the coast of Morocco." The description: "General colour varying from bright green, blue, or olive to uniform brown; spotted or marbled with olive-brown or blackish." The colour of *Rana Mascareniensis* is rather different: "General colour greyish olive or brownish olive above, with dark spots on the back . . . throat and chest more or less dusky or livid, the remainder of the under surface pure white." The descriptions shew clearly that though the latter is "very common in the backwaters and canals, and is found throughout the entire valley of the Nile," yet it is *Rana Esculenta* that is represented here. Frogs were considered sacred to the goddess Heqt, one of the deities presiding over childbirth. The predynastic frog from Naqada (No. 3) is made of pink and white limestone, the marbling of which seems intended to represent the markings on the creature.

The tortoise is extremely rare as a vase, No. 14 being the only specimen I know. The notched shell appears to be characteristic of *Testudo Leithii* ("Carapace broadly notched . . . marginals forming a more or less serrated border, with the undivided supracaudal projecting beyond them." AND. *Zool. Eg. Reptilia*, pp. 28–31, pl. ii). This creature however seems to be found only near Alexandria and in the Maryût district, which may perhaps be the reason that the tortoise was taken by the conquering race as one of the emblems of the evil one who took refuge in the marshes of the Delta. The only other kind of tortoise found in both Upper and Lower Egypt, *Trionyx Triunguis*, is quite unlike the shape of this vase.

The crocodile appears only once (No. 13). It is of pottery; the four legs, the head, and the tail are missing, but the shape of the animal is unmistakeable.

E. Fish-vases are common in predynastic times, and they also occur in the Middle and New Kingdoms. The usual form is of *Lates Niloticus*. No. 16 apparently represents a fish, though of what kind it is impossible to say; the tail is flat and square, the head pointed, but both pottery and modelling are too rough to admit of an exact identification. The religious significance of the fish was purely local.

F. The locust-vase is, I believe, unique. It is of Roman date and was found at Memphis.

78. The *provenance* of the vases shews that those of the predynastic period are found in the chief predynastic sites; those of the Middle Kingdom in Upper Egypt only, Beni Hasan, Dendereh, and Qurneh; the Hyksos vases are confined to Tell el Yehudiyeh in the Delta; the New Kingdom vases seem to be found only in Abydos and its neighbourhood; the later forms are from Nebesheh, Naukratis, and Memphis, the last two being great trading centres in Graeco-Roman times.

In looking at these vases it is impossible not to perceive a strong foreign influence. The xviiith dynasty vases of polished red or brown pottery, with spouts on the head or on the back, appear to be from the same source as the late vases from the Greek islands and from Naukratis (GARDNER, *Naukratis I*, pl. xv 5, 8; *II*, pl. xvii 12). This form of spout is found with

or without a rim in many of the predynastic forms, generally in buff pottery with purplish brown decoration (No. 6). The prehistoric polished black or red pottery vases often have merely an opening without any true spout; these fancy forms are all between S.D. 40 and 50, when, according to Prof. Petrie, a great change took place in the predynastic civilisation, and new influences were brought to bear upon Egypt. Figure and animal vases are, so far, not known in the proto-dynastic period and during the Old Kingdom, but in the Middle Kingdom they occur again. The head from Dendereh (No. 18) is of an un-Egyptian type, made of fine red pottery quite unlike Egyptian ware. This again is a deformed figure, judging by what remains of the arm. The lid was probably in the shape of the head-dress, which would be against the canons of Egyptian art; a lid might be in the form of a whole head, as in the ordinary canopic jars, but I do not know one instance of an Egyptian vessel in which part of the head lifts off. The bird from Qurneh (No. 15) has the same type of spout as the Mykenaean vases of El Amrah. It was found with pottery of the early Middle Kingdom (*Qurneh*, pl. xix, 488, 490, 491), but is not of the same clay. The ware is like the black pottery of the Hyksos tombs, though it shews none of the pricked designs distinctive of that period. The Beni Hasan vases appear to be definitely of Egyptian pottery, but the forms are extraordinarily rude, and cannot be compared with the vases of earlier or later periods, though made of the same material.

The Hyksos vases are mostly in the form of fish, and are invariably made of the black pottery with pricked designs characteristic of that people (PETRIE, *Hyksos and Israelite Cities*, pl. viii*a* 59–63).

The vases of the xviiith dynasty are all of the same style, and are made either of alabaster or of a foreign clay covered with a peculiar red or brown colour, more or less highly burnished. Both the type and the ware are unmistakeable.

The pottery vases, sometimes with merely a face indicated on the side, sometimes with arms rudely modelled beside the face, appear to represent Bes (Nos. 77, 78); they begin in the xxiind dynasty and continue till Roman times. The long duration of this shape accounts for the numbers found.

The late vases are of glazed ware; the pale blue dry glaze is of the xxvith dynasty, and the yellowish green glaze with black spots of the Roman period.

79. Pl. xxii. *Predynastic.*

1. Woman, standing. Steatopygous. Black polished pottery, very lustrous. H. 34·5 cm.; diam. across hips, 14·8 cm. Abadiyeh B 102. PETRIE, *Diospolis Parva*, pl. v. CAPART, *Primitive Art*, p. 128 (Ashmolean No. E 2779).

2. Woman. Black-topped red polished pottery. H. 18·8 cm.; diam. at rim, 4·3 cm. Abadiyeh B 83. PET. *Dios. Par.* pl. vi (Ashm. No. E 3201).

3. Frog. Rimmed opening on back, tubular handles at sides, eyes have originally been inserted. Pink limestone streaked with white. H. 4·7 cm.; L. 9·4 cm.; W. 8 cm. Naqada 695. PET. *Naqada and Ballas*, pl. xii 82 (Ashm. No. 1895–216).

4. Frog. Rimmed opening on back, tubular handles at sides. Stone. Mahasna, town-site. GARSTANG, *Mahasna*, pl. v 1. (The lower surface is shewn reflected.)

5. Frog. Rimmed opening on back, tubular handles at sides. Limestone (MacGregor Collection).

6. Vulture. Spout in front of neck and on back. Red polished pottery, decoration in darker red. H. 36 cm.; L. 34 cm. CAP. *Prim. Art*, p. 131, fig. 104 (Flinders Petrie Coll.).

7. Hippopotamus. Rimmed opening on back, tubular handles at sides. Pottery (MacG. Coll.).

8. Hedgehog. Rimmed opening on top, tubular handles at front and back. Stone (MacG. Coll.).

9. Hedgehog. Details incised and in relief. Stone (MacG. Coll.).

10. Hedgehog. Pale red pottery, details in dark red. H. 11·3 cm.; L. 13·8 cm. Abadiyeh. PET. *Dios. Par.* pl. xiv 67 (Ashm. No. E 2802).

11. Double elephant. Details incised. Yellow limestone. H. 12·8 cm.; diam. 7 cm. CAP. *Prim. Art*, p. 105, fig. 78 (F. P. Coll.).

12. Elephant. Alabaster. H. 7 cm.; L. from trunk to tail, 9 cm.; W. 6 cm. CAP. *Prim. Art*, p. 105, fig. 78 (F. P. Coll.).

13. Crocodile. Tail, head, and all four legs wanting; double longitudinal groove along back. Rough red pottery. H. 12·8 cm.; L. 27 cm. (Ashm. No. E 2811).

14. Tortoise. Four legs, shell indented at back; spout on back, hole at mouth. Red polished pottery. H. 12·2 cm.; L. 23·2 cm. PET. *Naq.* pl. xxvii 69*c* (F. P. Coll.).

Middle Kingdom.

15. Duck. Details incised; handle on back, spout on back of head. Black pottery. H. 10·8 cm.; L. 18 cm. Qurneh B 23. PET. *Qurneh*, pls. ix, xii, p. 3 (Edwards Coll.).

15A. Bird on nest. Head missing; four holes,

one at each end and each side. Coarse red pottery. H. 10·4 cm.|; L. 11·3 cm. Beni Hasan No. 165. GARS. *Burial Customs*, pl. xi, fig. 205 (Ashm. No. E 1981).

16. Fish (?). Pointed head, flat square tail, fins (?) under body; hole at top of head. Coarse red pottery. H. 7·5 cm.; L. 16·2 cm. Beni Hasan No. 41. GARS. *Bur. Cus.* pl. xi, fig. 208 (Ashm. No. 1974).

17. Man. Standing; head and feet missing, deformed arms; holds basket in right hand. Rough red pottery. H. 15·3 cm. Beni Hasan. GARS. *Bur. Cus.* pl. xi, fig. 203 (Ashm. No. E 2543).

18. Woman. Head and bust only remain, arm deformed; lid, probably in shape of head-dress, also missing. Fine red pottery. H. 15·3 cm.; diam. at top, 7·7 cm. PET. *Dendereh*, pl. xxi (Ashm. No. E 1966).

Pl. xxiii. *Predynastic.*

19. Duck, rising to fly. Spout on back. Red polished pottery. H. 10·7 cm.; L. 27 cm. PET. *Naq.* pl. xxvii 69*b*, p. 37 (F. P. Coll.).

20. Duck, swimming. Tubular handles at sides, rimmed opening on back. Fine buff pottery with lines in dark red. H. 6·9 cm.; L. 16 cm.; W. across handles, 8·8 cm. CAP. *Prim. Art*, p. 130, fig. 103 (F. P. Coll.).

21. Bird. Rimmed opening on back, tubular handles at sides. Fine buff pottery with cross-lines in dark red. H. 5·5 cm.; L. 7·8 cm.; W. across handles, 6·5 cm. CAP. *Prim. Art*, p. 130, fig. 103 (F. P. Coll.).

A similar vase in the same collection is made of fine buff pottery with waved lines in dark red. H. 6·7 cm.; L. 10·3 cm.; W. across handles, 9 cm.

22. Duck, swimming. Circular hole on back. Red polished pottery, horizontal lines of cordage-pattern in darker red. H. 5·4 cm.; L. 10·5 cm. CAP. *Prim. Art*, p. 130, fig. 103 (F. P. Coll.).

23. Duck, standing. Rimmed opening on back, tubular handles at sides. Fine buff pottery. H. 5·1 cm.; L. 8·2 cm.; W. across handles, 6·8 cm. CAP. *Prim. Art*, p. 130, fig. 103 (F. P. Coll.).

24. Bird. One head and neck, double body, foot under each breast and each tail. Handle from back of head to middle of back. Black polished pottery, pricked designs filled in with white. H. 13·1 cm.; L. 5·5 cm.; W. 7·2 cm. CAP. *Prim. Art*, p. 130, fig. 103 (F. P. Coll.).

25. Vulture (?). Hole on back, tail missing. Red polished pottery. H. 16 cm.; L. 17·1 cm.; W. 12 cm. CAP. *Prim. Art*, p. 130, fig. 103 (F. P. Coll.).

26. Pigeon. Green serpentine. H. 8·9 cm.; L. 12·4 cm. Naqada T 36 (male burial). PET. *Naq.* pl. xii 80, pp. 24, 36 (F. P. Coll.).

27. Duck. Head missing; rimmed opening on back, tubular handles at sides. Alabaster. H. 6 cm.; L. 9·6 cm. Hierakonpolis (Ashm. No. E 2809).

28. Bird. Rimmed opening on back, tubular handles at sides. Buff pottery, wavy lines in red. (MacG. Coll.).

29. Bird. Rimmed opening on back. Buff pottery, vertical lines of cordage-pattern in dark red (MacG. Coll.).

30. Pigeon (2 views). Circular hole on back, small hole at point of beak. Pale red pottery. H. 8·4 cm.; L. 11·7 cm. (F. P. Coll.).

31. Two birds (2 views). Rimmed openings on each back, ledge handle on each side. Red pottery. H. 10·4 cm.; L. 19·5 cm.; W. 14 cm. Naqada. PET. *Naq.* pl. xxxvi 90, p. 41 (Ashm. No. 1895–629).

32. Bird. Spout on back. Red polished pottery. H. 10·4 cm.; L. 19·5 cm. Naqada 268. PET. *Naq.* pl. xxvii 69*a* (Ashm. No. 1895–395).

33. Duck. Rimmed opening on back, tubular handles at sides. Eyes made of beads of shell. Serpentine. H. 6·2 cm.; L. 10·5 cm. Naqada. PET. *Naq.* pl. xii 81 (Ashm. No. 1895–217).

34. Duck. Rimmed opening on back, tubular handles across shoulders and tail; eye socket hollowed for insertion. Steatite. H. 4·7 cm.; L. 8·2 cm. Hierakonpolis. QUIBELL, *Hierakonpolis I*, pl. xx 4; *II*, p. 38 (Ashm. No. E 2808).

35. Fish. Pale red pottery. H. 3·4 cm.; L. 5·8 cm. (F. P. Coll.).

36. Fish. Details incised. Black burnished pottery. H. 9 cm.; L. 10·5 cm. (F. P. Coll.).

37. Fish. Rimmed opening on back, pierced with two holes under rim. Fine reddish pottery. H. 10·5 cm.; L. 16·1 cm. (F. P. Coll.).

38. Fish. Details incised. Fine brown pottery. H. 3·2 cm.; L. 4·1 cm. (E. Mackay, Esq.).

39. Fish. Head and tail missing; spout on back. Buff pottery with purple lines. H. 7·6 cm.; L. 10·2 cm. Abydos G. (Ashm. No. E 2814).

40. Fish. Rimmed opening on back, tubular handles at sides. Buff pottery with dark red cross-lines. H. 9·8 cm.; L. 15·5 cm.; W. across handles, 9 cm. Hierakonpolis (child's burial). QUIB. *Hierak. II*, pl. lxvi, p. 50 (Ashm. No. E 2807).

41. Fish. Spout on back. Black-topped red

polished pottery. H. 11·8 cm.; L. 15·8 cm. Abadiyeh B 101 (girl's burial). PET. *Dios. Par.* pl. v 8, p. 33 (Ashm. No. E 3198).

42. Fish. Rough reddish pottery. L. 12·8 cm.; W. 8·2 cm. Naqada 1700. PET. *Naq.* pl. xxvii 68*b*. (Ashm. No. 1895–626).

43. Fish. Spout at tail. Red polished pottery with black patch. L. 18·3 cm.; W. 11·8 cm. Naqada. PET. *Naq.* pl. xxvii 68*c* (Ashm. No. 1895–344).

Pl. xxiv. *XVIIIth Dynasty.*

44. Woman (3 views). Head and shoulders only remain; rimmed opening on head. Alabaster. NAVILLE, *Rec. Trav.* 1900, p. 65, pls. i–iii (MacG. Coll.).

45. Man, kneeling (3 views) Arms and legs deformed; rimmed opening on head; handle (now wanting) from back of head to middle of back. Alabaster. NAV. *Rec. Trav.* 1900, p. 65, pls. i–iii (MacG. Coll.).

46. Taurt, standing. Human head and body, hippopotamus legs; holds *sa*-sign; rimmed opening on head, handle at back. Alabaster (MacG. Coll.).

47. Woman, kneeling (3 views). Rimmed opening on head, plaited hair forms handle. Alabaster. NAV. *Rec. Trav.* 1900, p. 65, pls. i–iii (MacG. Coll.).

48. Woman, kneeling. Baby slung across back; horn on lap; spout on head, handle from top of spout to back of neck. Polished red pottery. (British Museum No. 24652).

49. Woman, kneeling (3 views). Baby slung across back; horn on lap; baby's head and woman's feet wanting. Spout on head, ring handle at back of head. Brown polished pottery, details of ornaments in black. H. 12·7 cm. Abydos (Russell Rea, Esq.).

50. Woman, standing. Steatopygous; spout on head, handle from top of spout to back of head. Red polished pottery. Abydos D 29. MACE, *El Amrah and Abydos*, pl. L 104, 107, pp. 72–75 (Cairo Museum).

51. Negro. Head only remains; spout on head. Polished red pottery with black spots. H. 4 cm. (F. P. Coll.).

52. Woman, seated. Spout on head. Alabaster. H. 9·5 cm. (Ashm. No. 1872–284*a*).

53. Woman, kneeling. Spout on head, handle from top of spout to back of neck. Polished red pottery (B.M. No. 30724).

54. Dwarf, standing. Bandy-legged, holds pitcher on left shoulder. Red pottery (B.M. No. 29935).

55. Bull with rider. Prof. Petrie suggests that this may represent Anpu riding upon Bata in the latter's incarnation as a bull. Upper part of rider missing; hole through rider's knee and at nose of bull. Alabaster, details in black paint. H. 13·7 cm.; L. 12·7 cm.; W. 7·8 cm. (F. P. Coll.).

56. Woman, standing. Holds musical instrument; spout on head. Polished red pottery (B.M. No. 5114).

57. Woman, seated. Holds scroll across lap; spout on head. Polished red pottery. (B.M. No. 24653).

Pl. xxv. *New Kingdom.*

58. Woman, standing. Steatopygous. Polished brown pottery; eyes, eyebrows, details of hair, necklace, and girdle in black. H. 17 cm. El Arabah E 178. GARS. *El Arabah*, pl. xix, p. 14 (Ashm. No. E 2427).

59. Jug, with woman's face. Handle at back, spout on head. Dark red polished pottery with details in black. H. 17·8 cm. El Arabah E 178 (found at head of burial). GARS. *El Arabah*, pl. xix, p. 14 (Ashm. No. E 2408).

60, 61. Two similar jugs. Polished red pottery (B.M. Nos. 29936, 29937).

62. Dwarf, seated. Arms clasped round knees; handle at back, tall spout on head. Polished red pottery (B.M. No. 29934).

63. Woman, standing. Left arm omitted; hole at left side and on top of head; necklace and bracelets, incised. Alabaster. H. 21 cm. Memphis. PET. *Memphis II*, pl. xxii 13 (B.M. Greek Dept.).

64. Woman. Upper part only; spout on head. Fine pale buff pottery, details of necklace and dress in dark red. H. 11·3 cm. Abydos D 29. MACE, *El Am.* pl. xlviii 1, pp. 72–75 (Ashm. No. E 2669).

65. Woman, standing. Holds basket with movable lid in left arm. Yellowish brown polished pottery; wig black, other details in red. H. 21·2 cm. Abydos, Shunet ez Zebib (girl's burial), found with No. 66. AYRTON, *Abydos III*, pl. xvi (Ashm. No. E 2431).

66. Woman, kneeling (2 views). Spout on head; found with string of glazed beads round neck. Brown polished pottery. H. 13·8 cm. Abydos, Shunet ez Zebib (girl's burial). AYRTON, *Ab. III*, pl. xvi (Ashm. No. E 2432).

67. Negress. Head only remains; spout on head, handle at back. Coarse black pottery (B.M. No. 4923). Scale 2 : 3.

68. Hedgehog (3 views, the third photograph is not to scale). Spout and small handle in front above head. Bright brown polished pottery, details in relief and in black. H. 7·4 cm.; L. 8·8 cm. Abydos

D xi. MACE, *El Am.* pl. L 1, 2, 4, pp. 72–74 (Ashm. No. E 2775).

69. Calf, couchant. Spout on head. Fine pinkish pottery, details in red. H. 11 cm.; L. 9·7 cm. Abydos D 29. MACE, *El Am.* pl. xlviii 1 (Ashm. No. E 2670).

70. Lion. Pinkish brown polished pottery, details in red and black. L. 16·4 cm. Abydos D 9. MACE, *El Am.* pl. xlix 1 (Ashm. No. E 2440).

71. Bird. Spout on head. Dark red polished pottery (B.M. No. 17046).

72. Hare, couchant. Spout on head. Buff pottery (B.M. No. 29668).

73. Frog. Spout on back. Buff polished pottery with purple spots. H. 6·9 cm.; L. 7·2 cm. Abydos E 178. GARS. *El Ar.* pl. xix 3 (Ashm. No. E 2426).

74. Fish. Spout on back. Blue glaze, details in black (B.M. No. 24410).

75. Fish. Hole at mouth. Blue glaze with incised lines (B.M. No. 17060).

76. Fish. Hole at mouth. Fine buff pottery. H. 7 cm.; L. 11 cm. Rifeh. PET. *Gizeh and Rifeh*, pl. xxvii 3 (Ashm. No. 09–128).

XXIInd–XXVIth Dynasties.

77. Bes. Grotesque face at side; spout at top. Pottery (MacG. Coll.).

78. Bes. Grotesque face with arms, at side; spout at top. Pottery (MacG. Coll.).

79. Bes, seated. Spout on head. Black pottery. H. 7·8 cm. (F. P. Coll.).

80. Taurt, standing. Spout on head. Blue glaze (MacG. Coll.).

81. Hedgehog. Spout on back. Blue glaze with diagonal incised lines, details in black. H. 5·3 cm.; L. 5·6 cm. (Ashm. No. E 3444).

Ptolemaic and Roman.

82. Locust. Spout and handle on back wanting. Pale yellowish green glaze, with black spots and patches of blue and white; details incised. H. 3·5 cm.; L. 7 cm. Memphis (Ashm. No. 1910–784).

83. Bird with human head. Greenish glaze with black spots. H. 6·4 cm.; L. 7·6 cm. (F. P. Coll.). The photograph is not to scale.

84. Child, standing on lotus blossom. Spout on head, small pierced handle at back of neck. Red pottery. H. 14·5 cm. (F. P. Coll.).

85. Frog with human head (2 views). Spout and overhead handle wanting. Black pottery. H. 3·7 cm.; L. 4·2 cm.; W. 3·8 cm. (F. P. Coll.).

86. Rhyton. Woman's head with rippled hair; point ends in bull's head. Spout and handle at top. Blue glaze (B.M. No. 37452).

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80. (I add the following list of examples that are not figured in these plates. These are in the Cairo Museum unless otherwise stated. W. M. F. P.)

Male.

87. Helmeted head with name of Apries; spout on top. Green-blue glaze. xxvi dynasty. Louvre. HEUZEY, *Figurines antiques du Louvre*, pl. vii 2, p. 5.

88. Man standing with arms raised supporting vase on back; very rude work. Alabaster. xviii dynasty. Broken at ankles, 10 cm. high. Bought in Cairo 1910.

89. Cupid winged, standing, arms bound to a tube behind back, rising out of a lotus flower at knees. Buff pottery, fine. 1st century B.C.? 12 cm. high. Bought from Fayum 1910.

90. Bearded man-headed sphinx, winged, lipped neck between wings. Blue glazed pottery, hinder end broken away. xxvi dynasty. 6 cm. high. Bought in Cairo 1910.

There are many of the usual Bes vases.

Female.

91. Rough pottery vase with female head, and arms raised, weeping. xii dynasty. 35 cm. high.

92. Rough pottery figure, open on top of head, holding breasts with open ducts. About 25 cm. high.

93. Standing figure, hands on front, rough work, no legs. Alabaster. 12 cm. high. xviii dynasty.

94. Similar to 93, better work. Alabaster. 20 cm. high. Nos. 3212, 820.

95. Standing figure, hands on front, slight stumps of legs, spout on head. Alabaster. 20 cm. high. xviii dynasty.

96. Top of figure, spout on head, but Egyptian style. Fine red polished pottery with black paint. xviii dynasty. Originally 18 cm. high.

97. Seated female and child, knees forward. Spout on head. Red polished pottery, black hair. 15 cm. high. Nos. 799, 192. xviii dynasty.

98. Another 12 cm. high. Buff pottery, flaky.

99. Another 10 cm. high. Buff.

100. Oval vase with female head on top. Spout

on head. Red polished pottery, 12 cm. high. xviii dynasty.

101. Bronze casting female bust with lid hinging on top of head. GRIFFITH, *Tell Nebesheh*, p. 98.

102. Similar bronze head seen in Cairo at dealers, 1910.

Quadrupeds.

103. Bull couchant, spout on head ; only fore part remaining. Light brown pottery, red lines. 10 cm. high.

104. Bull standing, hole in back of neck, loop handle. Dark brown pottery with white lines, as Syrian flasks. xviii dynasty. 15 cm. long.

105. Pig, mouth open and top hole ; guarded by a boy, with two jars at sides. Roman. 15 cm. long.

106, 107, 108. Hedgehogs, green glaze, xxvi dynasty.

Birds.

109. Hole in back, light brown pottery, red paint. xviii dynasty? 15 cm. high.

110. Long neck, spout in middle of back. Prehistoric. 27 cm. long.

111. Duck trussed, legs cut short, spout at end. Alabaster. xii dynasty. At Casira in Cairo 1910.

Fish.

112. Glazed pottery. xxvi dynasty.

Insect.

113. Locust, red polished pottery with black lines, fine work. Spout on top of head. xviii dynasty. 15 cm. long.

Note on p. 20. "The statue of Sebekhotep III at Arqo in Nubia is considered by Prof. Breasted to have been carried there in later times. If this supposition be true (for which there is no evidence at present) it does not affect the argument on p. 20, as the name of Sebekhotep III is also found at Gebeleyn and at Karnak, as well as his statues at Tanis. Hence it is evident that he reigned over all Egypt, irrespective of the original position of his statue in Nubia."

INDEX

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OFFERINGS TO AMEN, DURING 31 YEARS.

THOSE IN CONTINUOUS USE SHEW A PERIOD OF RATHER UNDER 31 YEARS

15a 2159	= 70 ×	30·84
1065	35	30·43
2743	90	30·48
1757 (53)	60	30·17
911	30	30·37
385	12½	30·80
1377	45	30·60
1111	36	30·86
20078	DAILY	30·91
185	6	30·83
217	7	31·0
15b 62	2	31
1550	50	31·0
15500	500	31·0
155	5	31·0
31	1	31
16a 246	8	30·75
82	8/3	30·75
52	5/3	31·2
125	4	31·2
46	1½	30·7
1809	60	30·15
1869	60	31·15
375	12	31·25
1668	54 (4 a month)	30·89
2490	96 (8 a month)	30·62
5200	168 (14 a month)	30·97
16b 44000	120 Month (4 daily)	30·56

OFFERINGS TO THE THEBAN GODS

DURING 11 YEARS OF MARCH FESTIVAL FOR 20 DAYS, ×11 = 220

31 YEARS OF AUGUST FESTIVAL FOR 27 DAYS, ×31 = 837

	YEARLY FEAST FOR 11 YEARS = 11 DAYS	20 DAYS OF FEAST FOR 11 YEARS = 220 DAYS	YEARLY FEAST FOR 31 YEARS = 31 DAYS	27 DAYS OF FEAST FOR 31 YEARS = 837 DAYS
17a 1057	...	1	...	1
1277	...	2	...	1
440	...	2	...	...
43,620	120	150	300	0
DIFFERENT	100	120	250	10
	80	90	200	20
SOLUTIONS	60	60	150	30
×	40	30	100	40
	20	0	50	50
685	20	...	15	...
4401 ×	18	6	12	3
OR	5	2	18	4
165	15	...	...	...
17b 485	30	...	5	...
11,220	20	50	...	...
9,845	30	20	30	5
3720	...	...	120	...
OR ×	...	...	12	4
375	20	...	5	...
62,540 ×	600	150	200	20
	360	100	100	40
OR	120	50	0	60
106,992	30	400	42	20
×	15	300	20	48
OR	16	100	36	100
13,020 ×	20	30	200	0
	48	10	8	12
6200	...	...	200	...
24,800	...	...	800	...
16,665	15	75	...	...
992,750	...	250	10000	750
17,340	20	75	20	0
×	100	40	24	8
572,000	40000	600	...	...
×	20000	1600	...	...
46,500	...	...	1500	...
441,800	1000	1000	1400	200
18a 127,400	...	100	700	100
116,400	1200	360	...	...
262,000	1000	1000	1000	...
344	20	...	4	...
48,420	500	150	50	10
	40	80	150	30
	30	50	100	40
×	200	10	50	50
28,200	...	100	200	...
3130	...	10	30	...
2210	60	...	50	...
310	...	...	10	...

	11 DAYS	220 DAYS	31 DAYS	837 DAYS
39,570	0	150	48	6
	8	100	400	6
×	20	25	10	40
	30	40	8	36
	70	100	0	20
219,215	125	900	100	20
93	...	...	3	...
1100	...	5	...	...
18b 62	...	...	2	...
778	20	...	18	...
31	...	...	1	...
93	...	...	3	...
110,000	...	500	...	...
310	...	...	10	...
93	...	...	3	...
62	...	...	2	...
155	...	...	5	...
31	...	...	1	...
44	4	...	...	...
3100	...	...	100	...
19a 620	...	...	20	...
559,500	...	500	1000	500
(98,550	1000	250	240 (90)	30 (80)
78,550)	0	40)	10	...
310	...	...		
1410	100	...	10	...
55	5	...	...	...
15500	...	...	500	...
310	...	...	10	...
3100	...	...	100	...
220	20	...	...	...
155	...	...	5	...
1550	...	...	50	...
620	...	...	20	...
310	...	...	10	...
6200	...	...	200	...
117	5	...	2	...
1550	...	...	50	...
19b 8985	4	25	3	4
620	...	...	20	...
15120	360	...	360	...
1515	25	...	40	...
69200	100	70	80	60
75400	100	70	280	60
150	8	...	2	...
265	10	...	5	...
3270	100	...	70	...
4200	100	...	100	...
3720	...	...	120	...
449500	...	...	1000	500
15500	...	...	500	...
1240	...	...	40	...
310	...	...	10	...
9610	20	30	90	0
	16	24	80	2
	12	18	70	4
	8	12	60	6
×	4	6	50	8
	0	0	40	10
20a 3782 ×	0	0	14	4
	2	30	100	0

	11 DAYS	220 DAYS	31 DAYS	837 DAYS
930	...	...	30	...
419 TO 19 } 1770	20	...	50	...
1112	25	...	...	1
54 + 81	1	...	4	...
20b				
6820	...	...	4	8
1410	100	...	10	...
1534	100	...	14	...
150	8	...	2	...
4060	200	...	60	...
25,020	20	...	800	...
57,810 { × ...		50	160	50
{ ...		50	700	30
21,700	...	...	700	...
1240	...	...	40	...
6570 { ...		...	75	5
{ × ...		...	48	6
{ ...		...	21	7
440	40	...	...	...
2200	200	...	...	...
15,500	...	...	500	...
21a				
441,000	6000	1000	5000	...
124	...	...	4	...
3100	...	...	100	...
15,500	...	...	500	...
124,357 { 20		550	20	3
{ × 100		360	125	48
{ 5000		22	2000	3
60,450	...	...	600	50
620	...	...	20	...
12,400	...	...	400	...
46,500	...	...	1500	...
110	10	....	...	...
144,720	2000	400	40	40
3410	10	15	...	...
110,000	...	500	...	...
68,200	200	300	...	...
349,000 { × 2000		500	1600	200
{ 12000		...	7000	...
21b				
19,150	50	...	60	20
65,480	500	50	500	40
3100	...	...	100	...
2170	...	...	70	...
770,200	1400	500	10,000	400
128,650	100	150	350	100
11,000	1000	...	...	...
31,000	...	...	1000	...
1,975,800	10,000	4000	4800	1000

OFFERING DURING 23 YEARS

	YEARLY
460	20
4600	200
35a	
23,000	1000
80,500	3500
920	40
460,000	20,000
920,000	40,000
103,500	4,500
34,500	1,500
80,500	3,500
69,000	3,000
11,500	500
35b	
2875	125
46	2
198,260	DAILY 24
1380	60
2990	130
16100	700
966	42
1866 } 703 } 5911 }	370 DAILY?
966 42 } 1242 54 } 1242 54 }	150
230	10
36a	
1150	50
2300	100
13,800	600
92	4
9200	400
4600	200
1150	50
34,500	1500
26,500	5500
26500	1150
34500	1500
690	30
23000	1000
34500	1500
36b	
1,150,000	50,000
4600	200
23,000	1000
4600	200
23,000	1000
46,000	2000
483,000	21,000
37a	
69,000	3000
92,000	4000
69,000	3000
26,500	1150
241,500	10,500
8,600 { 8280 DAILY	
{ 320 14 YEARLY	
92,000	4000
1,150,000	50,000
4600	200
92,000	4000
115,000	5000
2300	1000

OFFERINGS TO HAPI DURING 8 YEARS (2920 DAYS)

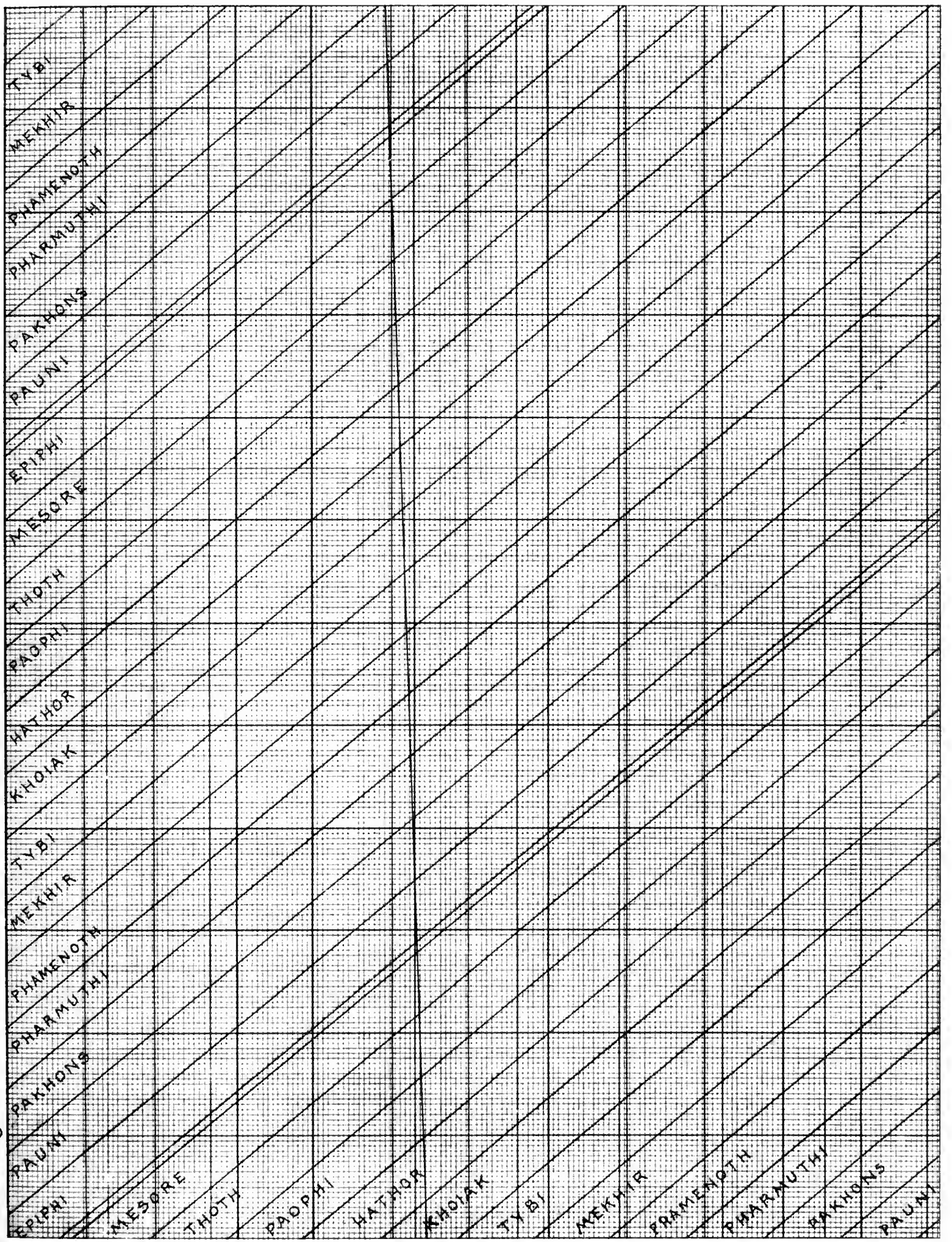
	YEARLY	DAILY
37b		
470,000	...	160 × 2937·5
879,224	...	300 2930·7
46,588	...	16 2910·5
49,432	...	17 2907·8
61,172½	...	21 2912·9
38a		
2923	...	1 2923·
209 } 7154 }	...	2½ 2945·2
12712	15 × 105·94	
38b		
11872	14 × 106	
848	1 × 106	
424	½ 106	
87,344	...	30 2911·5
254,240	300 × 105·94	
39		
11872	14 × 106	
848	1 106	
11872	14 106	
106000	125 106	
40a		
11872	14 106	
71,200	84 1059	
43900	...	15 2926·7
4240	5 106	
106000	125 106	
11872	14 106	
848	1 106	
40b		
8480	10 106	
43640	...	15 2909·3
74000	...	25 2960
114804	135 106·3	
6784	8 106	
13568	16 106	
41a		
10196	12 106·2	
41b		
5096	6 106	
10196	12 106·2	

OFFERINGS TO HAPI DURING 3 YEARS

	YEARLY	SOLE	
54a			
73,800	300 × 82		
6,150	25	82	
14,760	60	82	
41	...	½ × 82	
164	...	2	82
54b			
205	...	2½	82
574	...	7	82
164	...	2	82
287	...	3½	82
820	...	10	82
164	...	2	82
55a			
574	...	7	82
656	...	8	82
15,744	64 × 82		
984	4 × 82		
2968	12 × 82		
55b			
164	2 × 82 }		
3280	40 × 82 }	14 × 82	
205	...	2½	82
574	...	7	82
22960	...	280	82
45100	...	550	82
58a			
21000	...	256	81·97
14350	...	175	82
21000	...	256	81·97
1640	...	20	82
2970	12 × 82·5	...	
21000	...	256	81·97

OFFERINGS TO THE GODS DURING 31 YEARS.

	31 YEARS	28½ YEARS
63a		
782	25 × 31·28	
234	7½ 31·2	
29	...	1 29
63b		
428	...	15 × 28·53
399	...	14 28·50
218	7 31·14	
63c		
567	...	20 28·35
900	...	32 28·12
567	...	20 28·35
513	...	18 28·50
OILS FATS } 862	...	30 28·73
31	1 31	
64a		
287	...	10 28·7
2864	...	100 28·64
124	4 31	
5873	...	200 28·36
1562	50 31·24	
557	18 30·95	
62	2 31	
6278	20 31·39	
64b		
62	2 31	
4185	135 31	
930	30 31	
6583	21 31·35	
825,840	27,000 × 30·58	
31	1 31	
93	3 31	
28	...	1 28
7	...	¼ 28
64c		
496	...	17½ 28·34
100	...	3½ 28·57
212	...	7½ 28·27
65a		
72	...	2½ 28·8
2548	...	90 28·31
1142	...	40 28·55
100	...	3½ 28·57
65b		
3842	...	135 28·46
62	2 31	
4242	...	150 28·28
99	...	3½ 28·28
253	...	9 28·11
93	3 31	
198	...	7 28·28
65c		
2300	...	80 28·75
200	...	7 28·57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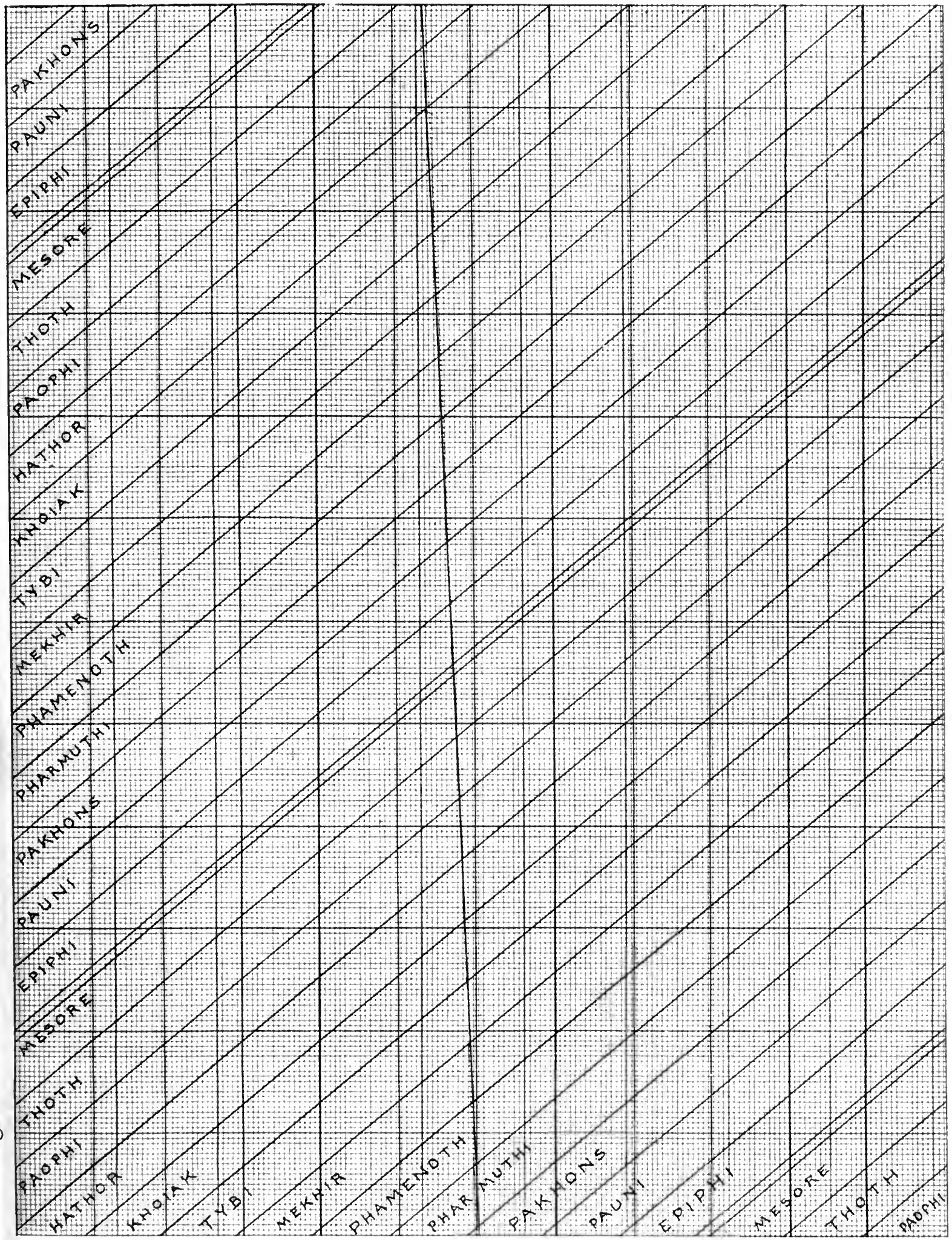
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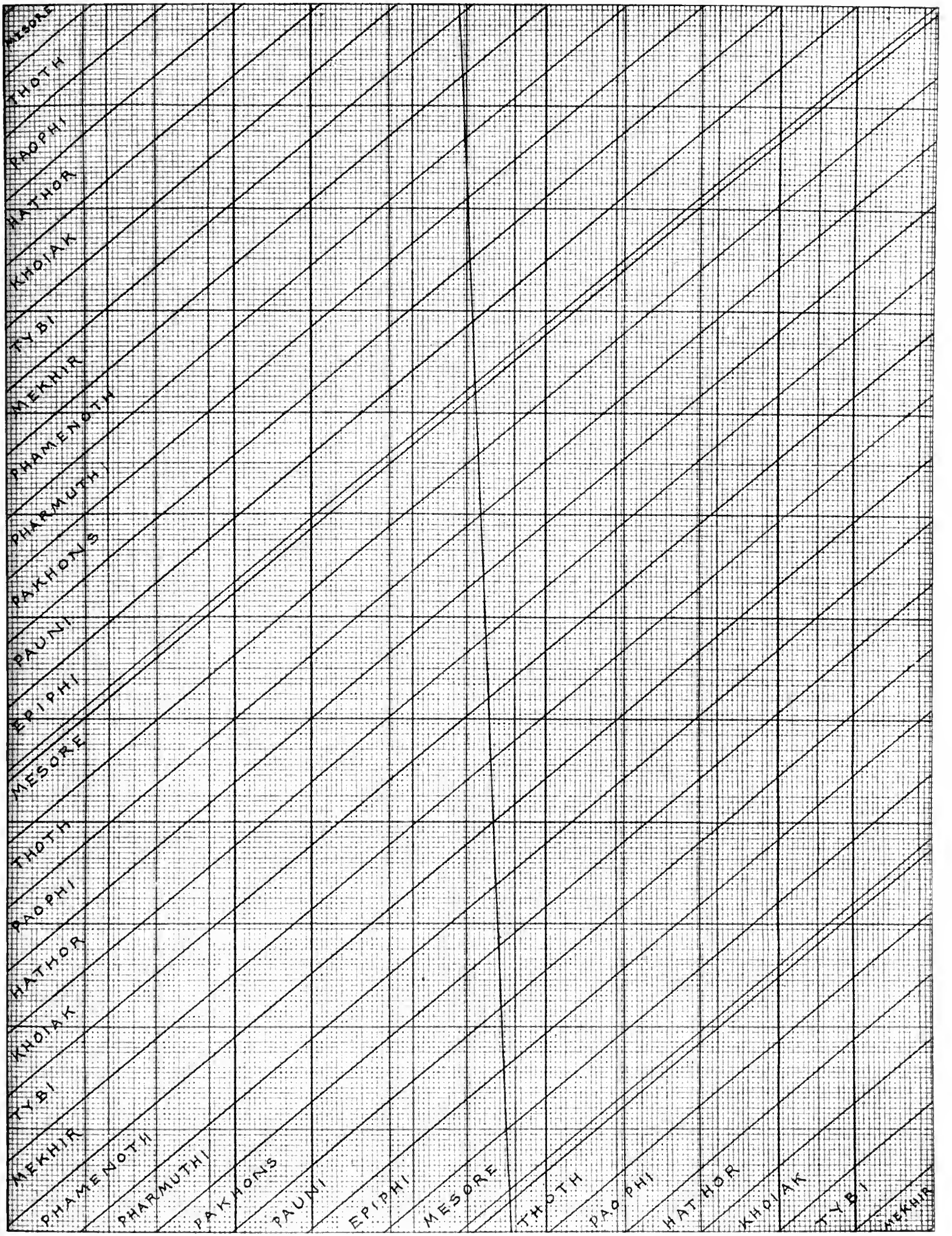
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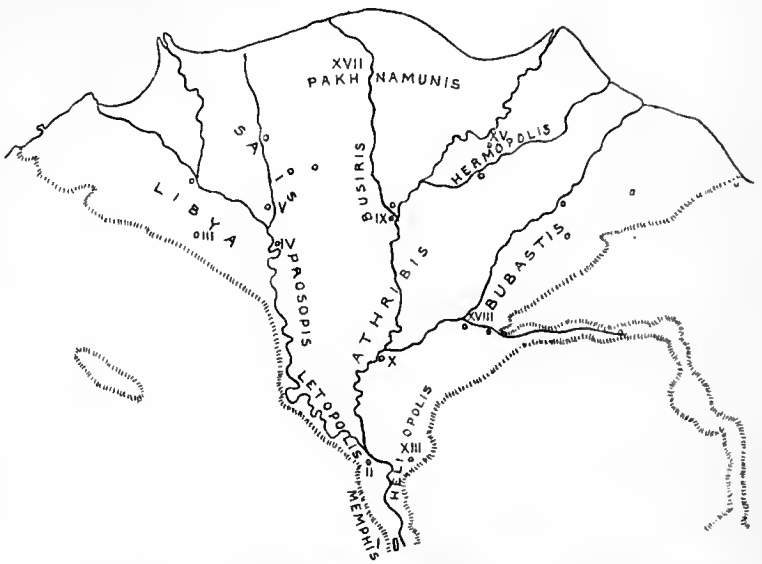
KHOIAK
TYBI
MEKHIR

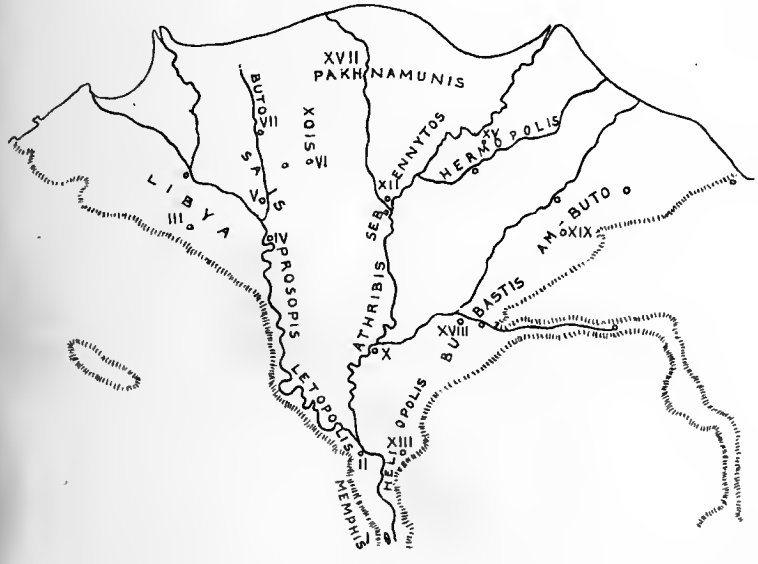
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R
Ant-her	1																
Sem-qen	1	1															
Khyan	2	·	1	·	·	·	1	·	·	7							
Yaqeb-her	··	1	3	··	··	··	1	··	··	2							
Apepa I	···	2	···	···	···	···	1	···	3	···							
Nofer-ka-ra	·	·	·	·	·	·	·	·	1	·							
Nub-ka-ra	··	1	··	··	··	··	··	··	··	··							
Kheper-ra	···	1	···	···	···	···	1	···	···	···							
Ka-ra	·	·	·	·	·	·	·	·	1	·							
Aa-neb-ra	··	··	··	··	··	··	··	··	2	··							
Uazed	···	···	1	···	···	···	1	···	···	2							
Sekt	·	·	·	1	·	·	1	·	·	·							
Sam-ka-ra	··	··	··	··	··	··	1	··	··	··							
Nofer-ut-uah-ra	···	···	···	···	···	···	1	···	···	···							
Maa-ab-ra	·	··	·	1	2	·	2	3	·	7							
Shesha	··	1	··	··	2	2	2	1	··	··	4	··	1	··	··	2	··
Aa-qer	···	···	···	···	···	···	1	···	···	···	···	···	···	···	···	···	···
Kha-user-ra	·	·	1	·	·	·	·	1	·	·	1	·	1	·	3	·	·
Se-khan-ra	··	··	··	··	··	··	··	··	··	··	··	··	··	3	1	2	1
Yaqeb-al	···	···	···	···	···	···	···	···	···	···	···	4	···	1	2	1	···
Aa	·	·	·	·	·	·	1	·	·	·	3	·	·	2	1	·	1
Aa-hotep-ra	···	···	···	···	···	···	···	···	···	···	1	···	···	···	···	1	···
Qar	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	1	·
Ykha	··	··	··	··	··	··	··	··	··	··	··	··	··	··	··	··	1
Ya	···	···	···	···	···	···	···	···	···	···	···	···	···	···	1	1	3
Maa-ra	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	1
Nuby-ra	··	··	··	··	··	··	··	··	··	··	··	··	··	··	··	··	1
Er-du-ra	···	···	···	···	···	···	···	···	···	···	···	···	···	···	···	1	···

MAP IV	MAP I	II A	II B	II C	II D	III E	III F	III G	V H	V J	VI K	VI L
	UPPER EGYPT	CORN-OSIRIS DUM.GEOG.INS II, I–III	CEREMONIES AT DUM.GEOG.INS II, IV	FEAST OF CULTIVATION DUM.GEOG.INS II, XVIII	MEMBERS OF OSIRIS DUM.GEOG.INS II, XVII	DELTA NOMES IN CONSECUTIVE ORDER	RELICS OF OSIRIS DUM.GEOG.INS III 1	RELICS OF OSIRIS DUM.GEOG.INS III, XLIII–LIII	INCREASED LIST OF NOMES H.MAR.AB.II.12 J.MAR.AB.I.14		ROMAN COINAGE	NOMES OF ROMAN WRITERS
I	ELEPHANTINE		9	10	4		1 LEFT LEG		ELEPHANTINE OMBOS. SILSILIS		OMBITES	OMBITES
II	APOLLINOPOLIS						2 TORSO		APOLLINOPOLIS HIERAKONPOLIS		APOLLONOPOLITES	APOLLONOPOLITES HIERAKONPOLIS
III	EILEITHYIAPOLIS						3 JAWS		NEKHEB, PEMER ANY, HASFIN, AND 5		LATOPOLITES	EILEITHYIA LATOPOLIS
IV	THEBAI								TUPHION, HERMONTHIS THEBAI, MAAD		HERMONTHITES DIOPOLITES	HERMONTHITES THEBAI
V	KOPTOS	1	4					ARTERIES?	QESI, NUBT KOPTOS, HASI AST		KOPTITES	KOPTITES
VI	TENTYRA			16	16		4 RIGHT LEG		NUTER KHET TENTYRA, NEBUT		TENTYRITES	TENTYRITES
VII	DIOSPOLIS						5 PHALLUS		SESHESHT, TABENNA DIOSPOLIS, ATEB, SAMHUD			DIOSPOLITES
VIII	THINIS	2	2	2	2		6 HEAD		GERG, ABDU THENI, MENSHIYEH		THINITES	THINITES
IX	PANOPOLIS								PANOPOLIS		PANOPOLITES	PANOPOLITES
X	APHRODITOPOLIS			15							ANTAIOU POLITES	ANTAIOPOLITES APHRODITOPOLITES
XI	HYPSELE						7 STOMACH				HYPSELITES	HYPSELITES
XII	HIERAKONPOLIS						8 INTESTINES					
XIII	LYKOPOLIS			8	7		9 LUNGS				LYKOPOLITES	LYKOPOLITES
XIV	KOUSAI	4	6	13	6		10 LIVER					PHATURITES
XV	HERMOPOLIS										HERMOPOLITES	HERMOPOLITES
XVI	HIBIU											ANTINOE
XVII	KYNOPOLIS										KYNOPOLITES	KYNOPOLITES
XVIII	HIPPONON							FLUIDS				
XIX	OXYRHYNKHOS										OXYRHYNKHITES	OXYRHYNKHITES
XX	HERAKLEOPOLIS	3	10	14				ARM			HERAKLEOPOLITES	HERAKLEOPOLITES
XXI	NILOPOLIS				12			LEG (SAP-MER)			ARSINOITES	ARSINOITES
XXII	APHRODITOPOLIS										APHRODITOPOLITES	APHRODITOPOLITES
	DELTA					MAP III		MAP IV		J		
I	MEMPHIS		3	7	3	1		(HEAD)	MEMPHIS PA-PENAT		MEMPHITES	MEMPHIS
II	LETOPOLIS	7	5			2	12 NECK	NECK	LETOPOLIS KHERKHER		LETOPOLITES	LETOPOLIS
III	LIBYA	12	14	?	9	3	4 RIGHT LEG	LEG	LIBYA (AMU) AMENT		LIBYA, NAUKRATITIS MAREOTIS, ALEXANDREIA	MOMEMPHIS, MAREIA NAUKRATIS, NITRIOTIS ALEXANDREIA
IV	PROSOPIS	11	13	4	11	4	14 EYE	EYE	PROSOPIS (KA) TAQUA (AQ)		PROSOPITES PHTHEMPHU	PROSOPIS PHTHEMPHU
V	SAIS	8	16	3	8	5		EAR	SAIS		SAITES KABASITES	SAIS KABASA
VI	XOIS							FLUIDS	XOIS		XOITES GYNAIKOPOLITES	XOIS, HERMOPOLIS GYNAIKOPOLIS
VII	METELIS							SHOULDERS PE-DEP KHU	MENELAOS METELIS BUTO (KHEBT)		METELITES MENELAITES PHTHENEOTES	METELIS MENELAOS BUTO
VIII	HEROOPOLIS							SKIN	HEROOPOLIS			HEROONPOLIS PHAGRORIOPOLIS
IX	BUSIRIS		1	1	1		13 SPINE	B·Q·S·	BUSIRIS		BOUSIRITES	BUSIRIS CYNOPOLIS
X	ATHRIBIS	10	12	?	15	6	11 HEART	HEART			ATHRIBITES LEONTOPOLITES	ATHRIBIS LEONTOPOLIS
XI	PHARBAITHOS							EAR	KA-HESED PHARBAITHOS (MERTI)		PHARBAITHITES	PHARBAITHOS
XII	SEBENNYTOS					7		SHIN BONES	SEBENNYTOS		SEBENNYTES ONUPHITES	SEBENNYTOS ONUPHIS
XIII	HELIOPOLIS	5	7	?	5	9		THIGH BONE	HELIOPOLIS ATI		HELIOPOLITES	HELIOPOLIS
XIV	TANIS-SETHROE							DAD AMULET	TANIS SETHROE (ZEF)		TANITES SETHROITES PELOUSION	TANIS SETHROE PELOUSION
XV	HERMOPOLIS	9	11	?	14	10		KHU-HEART	TEKH BAHT		NEOUT	PANEPHYSIS
XVI	MENDES							PHALLUS, SPINE	HAP		MENDESIOS	MENDES
XVII	PAKHNAMUNIS DIOSPOLIS	6	8	?	10	8			HU		PAKHNAMOUNIS DIOSPOLITES	PAKHNAMOUNIS
XVIII	BOUBASTOS	13	15	?	13	11		LEG			BUBASTITES	BUBASTOS
XIX	BUTO					12		EYE BROWS				
XX	ARABIA							MAFEK AMULET			ARABIA	ARABIA

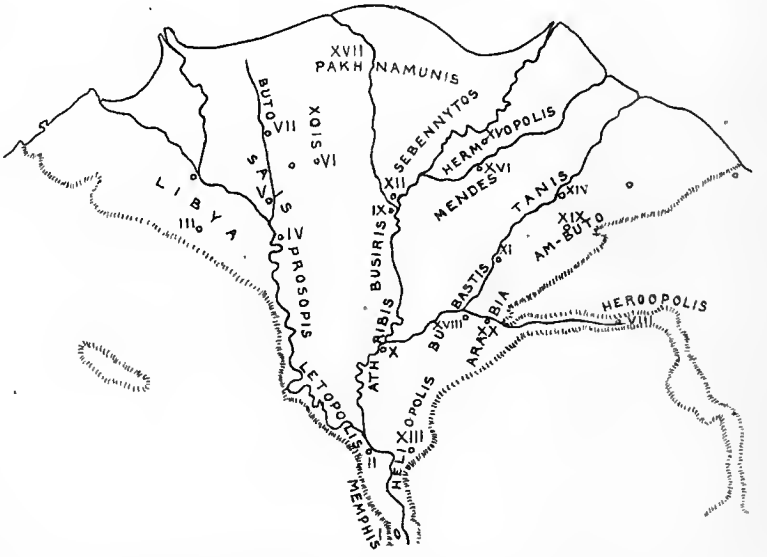
I. PREHISTORIC. CITIES OF THE CORN-OSIRIS.
(DUM. GEOG. INS. II, I–III; Z·A·S·, 1881, 79; REC. III, 44).



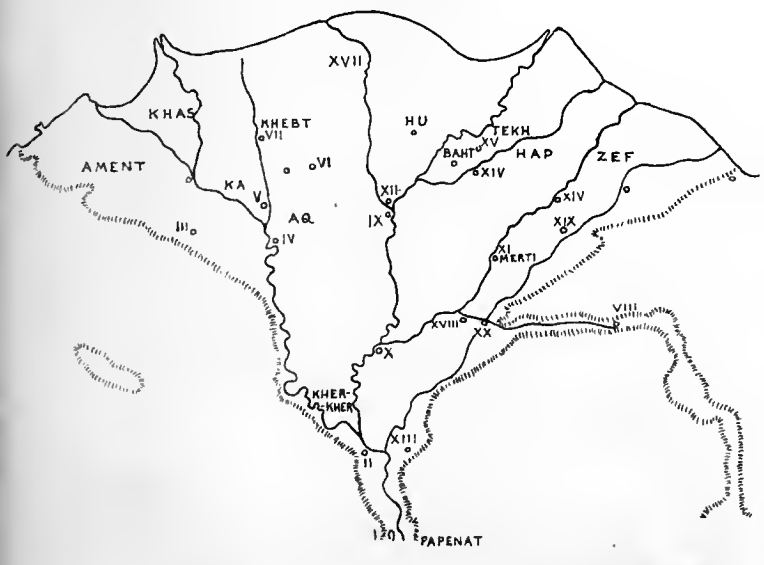
II. EARLIEST KINGDOM. GREATER RELICS OF OSIRIS.
(DUM. GEOG. INS. II, IV, XVII, XVIII; Z·A·S·, 1881, 84, 96, 97; REC. III, 49; V. 85, 87).



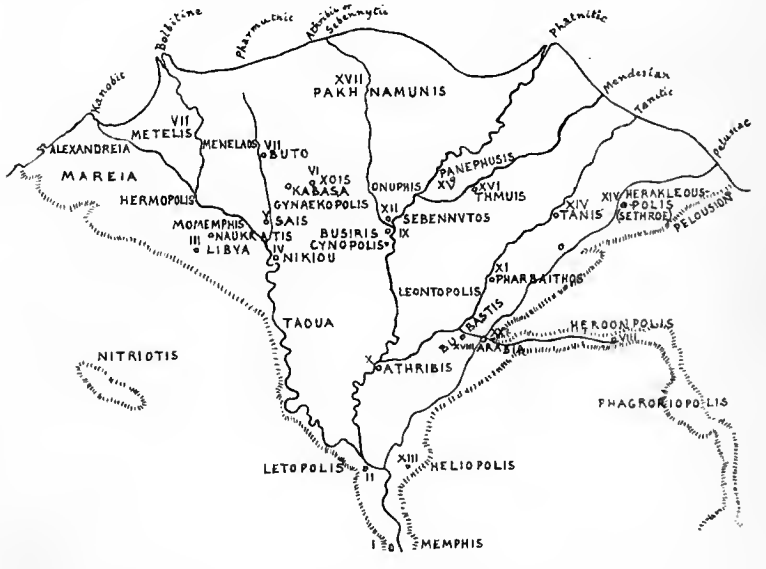
III. OLD KINGDOM. REGULAR ORDER OF NOMES IN FIVE RADII.



IV. MIDDLE KINGDOM. STANDARD LIST OF NOMES.
(DENDEREH; DUM. GEOG. INS. III, III-XXV).

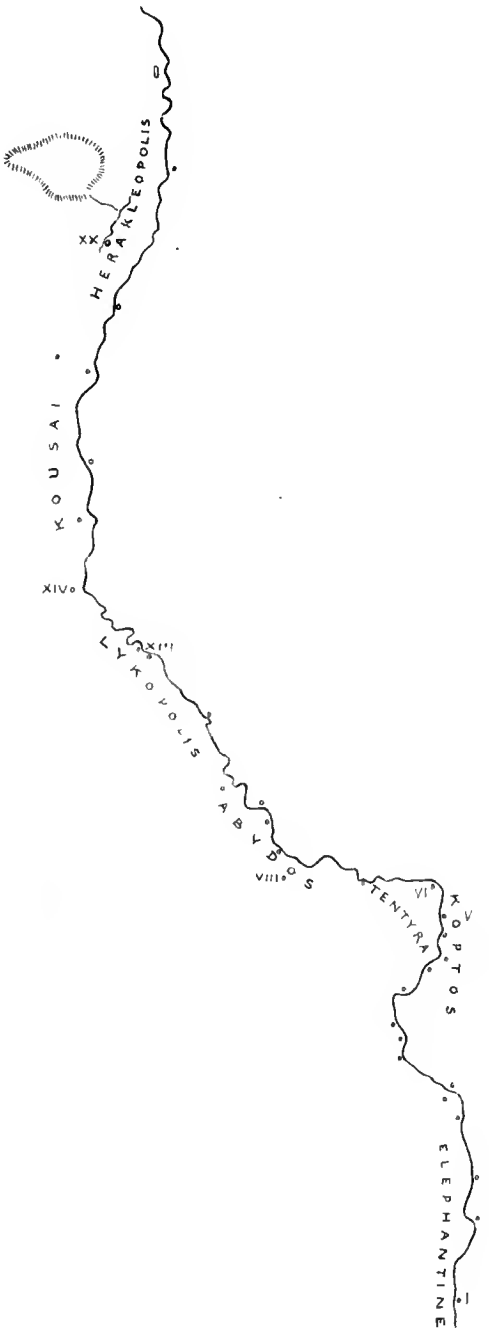


V. NEW KINGDOM. NAMES OF ADDITIONAL NOME DIVISIONS.
(MARIETTE ABYDOS I, 14).

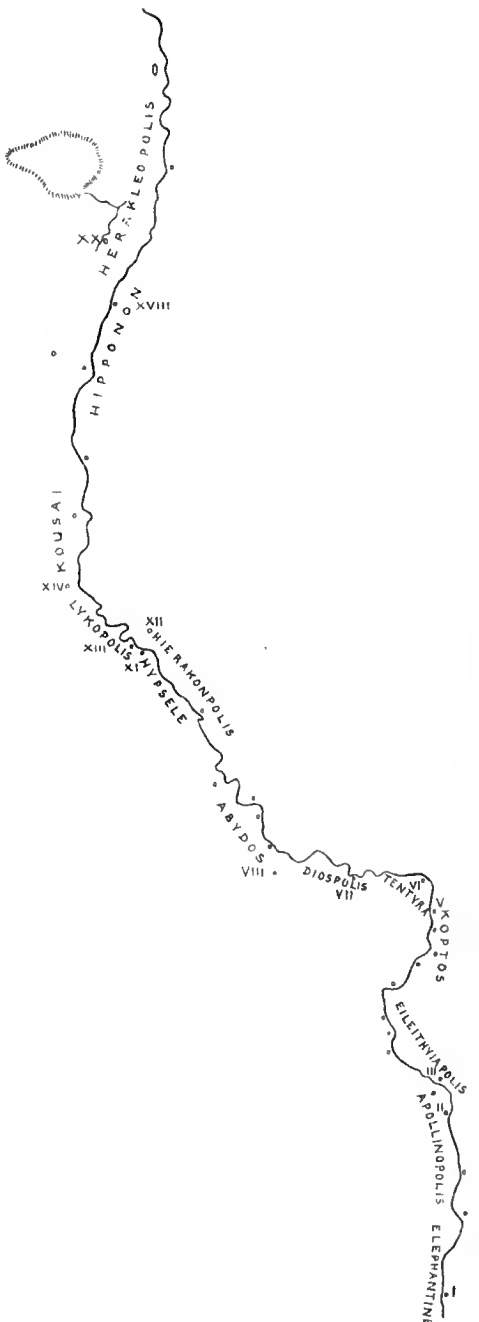


VI. ROMAN EGYPT. NOMES IN STRABO, PLINY, PTOLEMY AND COINS.

I. PREHISTORIC.
CITIES OF THE CORN-OSIRIS.



II. EARLIEST KINGDOM.
GREATER RELICS OF OSIRIS.



III. OLD KINGDOM.
ALL RELICS OF OSIRIS.

IV. MIDDLE KINGDOM.
STANDARD LIST OF NOMES.

V. NEW KINGDOM.
FULL LIST OF NOMES.
(MARIETTE ABYDOS I, 14).

VI. ROMAN EGYPT.
NOMES IN STRABO PLINY
PTOLEMY AND COINS.

REGNAL YEARS.	A.D.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI	XII	XIII.	XIV	XV	Total.
CLAUDIUS 1.	40-1																
" 2.	41-2.		57					1.						2.			60
" 3.	42-3	1.	91.		1.	1.	1.							4.			99
" 4.	43-4.	2.	59.			1.								4.			66.
" 5.	44-5		21.		1.	1.								2.			25.
" 6.	45-6	2.	133.		1.									2.			138.
" 7.	46-7.																
" 8.	47-8																
" 9	48-9.																
" 10.	49-50.																
" 11.	50-1.																
" 12.	51-2.																
" 13.	52-3.																
" 14.	53-4.																
" 15. NERO 1.	54-5.																
NERO 2.	55-6																
" 3.	56-7.	3.	137.		4.	1.							1.	2.			148.
" 4.	57-8.		59.		2.									2.			63.
" 5.	58-9.		185.		7.	1.								4.			197.
" 6.	59-60.	1.	33.		2.									2.			38.
" 7.	60-1.																
" 8.	61-2.																
" 9	62-3.		6.														6.
" 10.	63-4.	9	319	3.	6.	11.	9.	2.	1.			1.		76.			437.
" 11.	64-5.	10.	565	10.	10.	34.	12.	3	3.		1.	7.		148.			803.
" 12.	65-6.	14.	612.	19.	8.	33.	22.	2.	7.		3.	13.		223.			956.
" 13.	66-7.	7.	504.	8.	11.	39.	9.		7.		1.	9.	2.	171.			768.
" 14. GALBA 1.	67-8.	1.	380.	6.	8.	12.	7.	1.	5.			9.	1.	79.			508.
GALBA 2. OTHO 1. VITELLIUS 1. VESPASIAN 1.	68-9.	4.	189.	1.		14.	5.					7.		27.			247.
VESPASIAN 2.	69-70.	3.	176.	3.	4.	9.	7.					3.		28			233.
" 3.	70-1	1.	17.	1.		1.	1.					2.		1.			24.
" 4.	71-2.																
" 5.	72-3																
" 6.	73-4																
" 7.	74-5																
" 8.	75-6.		3.			1.											4.
" 9.	76-7.																
" 10.	77-8.																
" 11 TITUS 1.	78-9.																
TITUS 2.	79-80.		9.									1.		2.			12.
" 3.	80-1.		22.	1.		1.								5.			29.
" 4. DOMITIAN 1.	81-2.																
DOMITIAN 2.	82-3.							1.									1.
" 3	83-4.																
" 4.	84-5.																
" 5	85-6.																
" 6.	86-7.		1.														1
" 7	87-8.																
" 8.	88-9.																
" 9.	89-90																
" 10.	90-1.																
" 11.	91-2.																
" 12.	92-3.																
" 13.	93-4																
" 14.	94-5.																
" 15.	95-6.																
" 16. NERVA 1.	96-7.		22.			1.		1.						3.			27.
NERVA 2. TRAJAN 1.	97-8																
TRAJAN 2.	98-9.																
" 3.	99-100																
" 4.	100-1.																
" 5.	101-2.		13.		1.			1.						2.			17.
" 6.	102-3.		7.			2.			1.					1.			11.
" 7.	103-4.		1.														1.
" 8.	104-5		1.														1.
" 9.	105-6.		3.														3.
" 10.	106-7																
" 11.	107-8.		6.														6.
" 12.	108-9.																
" 13.	109-10.																
" 14.	110-1.		1.			1.											2.
" 15.	111-2.		16.	1.	1.	1.	1.					3.	1.				24.
" 16.	112-3.		2														2.
" 17.	113-4.																
" 18.	114-5.		6.		2.	2.					1.			6.			17.
" 19.	115-6.		12.			2.	1.					1.		1.			17.
" 20. HADRIAN 1.	116-7.	1.	21.			4.	1.					1.		6.			34.
HADRIAN 2.	117-8.	1.	13.	1.	2.	4.	4.							3.			28.
" 3.	118-9.	1.	18	1.	3.	2.	1.	1.				1.		10			38.
" 4.	119-20.		21.	2.	1.	6.	1.	1.				2.		7.			41.
" 5.	120-1		17.	1.	2.	7.	3.		1.			1.		3.			35.
" 6.	121-2.		23.	2.	1.	9.	3.					1.		12.			51.
" 7.	122-3.																
" 8.	123-4.		13.			9.	3.	1.	2.			3.		12.			43.
" 9.	124-5.		20.											1.			21.
" 10.	125-6.		56.	2.	1.	7.	3.	1.	3.		1.	1.	1.	9.			85.
" 11.	126-7.		24.	1.		2.	2.	1.						2.			32.
" 12.	127-8.	1.	37.		1.	3.	2.							11.			55.
" 13.	128-9		44.	3.										18.			65.
" 14	129-30.		31.	1.		2.	2.					3.	1.	6.			46.
" 15.	130-1.		46.	1.	1.	4.	1.		1.			1.		7.			62.
" 16.	131-2.		36.	1.	1.	5.		1.				2.		9.			54.
" 17.	132-3.		21.	1.	2.	3.	2.		1.			1.		6.			37.
" 18.	133 4		26.	2.	1.	3.						1.		6.			39.
" 19.	134-5.		33.		1.	3.	1.					1.		15.			53.
" 20.	135 6.		38.	3.		4.	1.					1.		3.			50.
" 21.	136-7.		31.		2.	1.	3.		1.					7.			46.
" 22. ANTONINUS 1.	137-8		25.			3.	1.							3.			32.
ANTONINUS 2.	138 9		12.	1.		4.								2.			19.
" 3	139 40.		12.	1.			3.	1.					1	2.			20.
" 4.	140-1		12.	2.	2.	5.		1.				2.		5.			30.
" 5.	141-2.		2.	2.		2.	3.										9.
" 6.	142-3.		2.				1.										3.
" 7.	143-4.		10.			6.	2.					1.		9.			28.
" 8.	144-5		5.			7.	1.							4.			17.
" 9.	145-6.		2.			4.								4.			10.
" 10.	146-7.		2.				1.							4.			7.
" 11.	147-8		4	1.	2.	1.	1.					1.		4.			14.
" 12.	148 9		3.		2.	2.	1.					1.		2.			11.
" 13.	149-50.					1.	1.							5.			7.
" 14.	150-1		3.		1.		2.		1.					1.			8
" 15.	151-2.		2.	2.		4.	4.							2.			14.
" 16.	152-3.		1.			3.	1.							3.			8.
" 17.	153-4.											1.		5.			6.
" 18	154 5.		1.			2.	3.		1.			1.		3.			11.
" 19	155-6.			2.		1.	1.							3.			7.
" 20.	156-7.											1.					1.
" 21.	157-8.		1.			3.											4.
" 22.	158 9		2.		1.	3.	1.		1.					3.			11.
" 23.	159 60.		1.				1.					1.		1.			4.
" 24 AURELIUS & VERUS 1.	160-1		1.			1.											2.
AURELIUS & VERUS 2.	161 2.		3.			1.											4.
" " 3.	162 3		1.			2.								1.			4
" " 4.	163 4.			2.	1.	2.	1.		1.					6.			14.
" " 5.	164 5		1.		1.	1.	3.				1.			1.			8.
" " 6.	165 6							1.									1.
" " 7.	166 7			1.										1.			2.
" " 8.	167 8.								1.				3.	1.			5.
" " 9	168 9												4.	8.	1.		19.
AURELIUS 10.	169-70.				1.	2.	2.					1.					

J.G.M.

REGNAL YEARS	A.D.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.	Total
AURELIUS 11.	170-1.																
" 12.	171-2.																
" 13.	172-3.																
" 14.	173-4.																
" 15.	174-5.																
" 16.	175-6.																
" 17.	176-7.													1.			1.
" 18.	177-8.																
" 19.	178-9.																
" 20. COMMODUS 20.	179-80.																
COMMODUS 21.	180-1.					1.					2.		3.	21.			27.
" 22.	181-2.												1.	26.			27.
" 23.	182-3.										2.		5.	18.			25.
" 24.	183-4.													10.			10.
" 25.	184-5.										1.	1.	1.	13.			16.
" 26.	185-6.												1.				1.
" 27.	186-7.										3.	1.	2.	44.			50.
" 28.	187-8.								2.		2.		5.	37.			46.
" 29.	188-9.								2.		3.	2.	3.	67.			77.
" 30.	189-90.					1.		1.	4.		2.	2.	11.	106.	1.		128.
" 31.	190-1.													5.			5.
" 32.	191-2.												1.	7.			8.
" 33. PERTINAX 1. NIGER 1.	192-3.																
NIGER 2. SEVERUS 2.	193-4.										1.			3.			4.
SEVERUS 3.	194-5.																
" 4.	195-6.					1.								1.			2.
" 5.	196-7.																
" 6.	197-8.																
" 7.	198-9.																
" 8.	199-200.																
" 9.	200-1.																
" 10.	201-2.																
" 11.	202-3.																
" 12.	203-4.																
" 13.	204-5.																
" 14.	205-6.																
" 15.	206-7.																
" 16.	207-8.																
" 17.	208-9.																
" 18.	209-10.																
" 19. CARACALLA & GETA 19.	210-1.																
CARACALLA, & GETA 20.	211-2.					1.											1.
CARACALLA 21.	212-3.																
" 22.	213-4.																
" 23.	214-5.																
" 24.	215-6.																
" 25. MACRINUS 1.	216-7.																
MACRINUS 2. ELAGABALUS 1.	217-8.																
ELAGABALUS. 2.	218-9.							1.		1.	2.		7.	28.		1.	40.
" 3.	219-20.								4.	8.	2.		17.	32.			63.
" 4.	220-1.						4.		4.	5.	3.	1.	12.	50.	1.		80.
" 5. ALEXANDER, 1.	221-2.						1.	2.	4.	4.	4.	2.	20.	57.		1.	95.
ALEXANDER 2.	222-3.								4.	9.	2.		22.	60.			97.
" 3.	223-4.								2.	4.	1.	2.	11.	40.			60.
" 4.	224-5.						8.		3.	28.	2.	5.	29.	123.			193.
" 5.	225-6.							2.	3.	8.	2.		19.	65.			99.
" 6.	226-7.							1.	1.	3.	4.	3.	5.	32.			49.
" 7.	227-8.								1.	1.				5.			7.
" 8.	228-9.																
" 9.	229-30.																
" 10.	230-1.								1.	1.			2.	1.			5.
" 11.	231-2.						2.		3.	2.	3.		12.	38.			60.
" 12.	232-3.						1.		1.		2.	1.	13.	9.			27.
" 13.	233-4.									1.		1.	4.	11.			17.
" 14. MAXIMINUS 1.	234-5.						1.		1.	1.	1.		4.	7.			15.
MAXIMINUS 2.	235-6.									6.	2.	1.	34.				43.
" 3.	236-7.						1.	1.	3.	6.	3.	2	30.	4.			50.
" 4. GORDIANUS I & II. 1.	237-8.								1.	13.	3.	2	37.				56.
BALBINUS & PUPIENUS 1. GORDIANUS III. 1.																	
GORDIANUS III. 2.	238-9.								2.	4.	2	2	12.				23.
" 3.	239-40.								1.	3.	1.	1.	18.	1.	1.		26.
" 4.	240-1.					1.			1.	5.	3.	1.	23.	2.	1.		37.
" 5.	241-2.								3.	6.	2	1.	29.	3.			46.
" 6.	242-3.					2.			2.	24.	7.	5.	38.	7.		2.	84.
" 7. PHILIP 1.	243-4.								6.	47.	12	4	52.	6.			125.
PHILIP. 2.	244-5.							1.	2.	58.	13.	3.	51.	8.			125.
" 3.	245-6.					1.		2.	2.	45.	5.	3.	41.	4.			103.
" 4.	246-7.					1.		2.	6.	36.	14.	2	55.	6.	1.	1.	123.
" 5.	247-8.								1.	38.	8.	2	65.	5.			119.
" 6.	248-9.								1.	41.	3.	2	55.		1.		103.
" 7. DECIUS 1.	249-50.								7.	25.	7.	3.	48.	5.			95.
DECIUS 2.	250-1.									3.	4.	4.	9.				20.
" 3. GALLUS 1.	251-2.																
GALLUS 2. AEMILIAN 1.	252-3.																
" 2. " 2. VALERIAN 1.	253-4.					1.		2.	5.	25.	14.	15.	64.	5.			131.
VALERIAN & GALLIENUS 2.	254-5.							1.	1.	1.	6.	1.	4.				14.
" " 3.	255-6.							1.	1.	93.	20.	22.	104.	5.	1.		252.
" " 4.	256-7.								3.	135.	42.	36.	146.	11.	1.		372.
" " 5.	257-8.								8.	62.	21.	14.	70.	3.	2.		175.
" " 6.	258-9.								1.	30.	9.	6.	16.	2.	1.		95.
" " 7.	259-60.									92.	32.	26.	89.	7.			246.
MACRIANUS & QUIETUS 1.	260-1.									5.	7.	11.	20.	4.			47.
GALLIENUS 9. " 10.	261-2.									26.	35.	44.	35.	2.			142.
" 11.	262-3.									8.	14.	12.	23.	2.	1.		60.
" 12.	263-4.									17.	34.	34.	23.	7.			115.
" 13.	264-5.									21.	48.	32.	47.	9.	2.		159.
" 14.	265-6.									2.	65.	72.	80.	12.	4.	1.	236.
" 15. CLAUDIUS II. 1.	266-7.										116.	141.	117.	13.	1.	1.	389.
" 16.	267-8.										239.	428.	146.	21.	8.	4.	846.
CLAUDIUS II. 2.	268-9.										215.	703.	71.	10.	53.	11.	1069.
" 3. QUINTILLUS 1. AURELIAN 1.	269-70.										15.	24.	28.	2.	22.	108.	195.
AURELIAN 2. VABALLATHUS 5.	270-1.										2.	3.	2.	2.	2.	151.	170.
" 3.	271-2.										17.	45.	1.	1.		1.	65.
" 4.	272-3.												2.	7.		8.	17.
" 5.	273-4.												5.	15.	2.	8.	29.
" 6.	274-5.												1	5.	3.	29.	38.
" 7. TACITUS 1. PROBUS 1.	275-6.													3.	7.	16.	26.
PROBUS 2.	276-7.													4.	6.	31.	61.
" 3.	277-8.														6.	45.	51.
" 4.	278-9.														6.	33.	39.
" 5.	279-80.														7.	31.	68.
" 6.	280-1.														13.	65.	78.
" 7.	281-2.														15.	83.	98.
" 8. CARUS 1. CARINUS & NUMERIANUS	282-3.														38.	169.	207.
CARINUS 2. NUMERIAN 2.	283-4.														38.	165.	203.
" " 3. DIOCLETIAN 1.	284-5.														43.	280.	323.
DIOCLETIAN 2. MAXIMIAN 1.	285-6.														70.	321.	391.
" 2. " 2.	286-7.														103.	539.	642.
" 3. " 3.	287-8.														82.	513.	595.
" 4. " 4.	288-9.														71.	514.	585.
" 5. " 5.	289-90.														58.	343.	401.
" 6. " 6.	290-1.														24.	365.	389.
" 7. " 7.	291-2.														42.	117.	159.
" 8. " 8.	292-3.														23.	61.	84.
" 9. " 9.	293-4.														22.	40.	62.
" 10. " 10.	294-5.														20.	25.	45.
" 11. " 11.	295-6.														7.	4.	11.
Total		62.	4344.	89.	98.	311.	161.	38.	131.	950.	1089.	1813.	1923.	2146.	818.	4118.	18086.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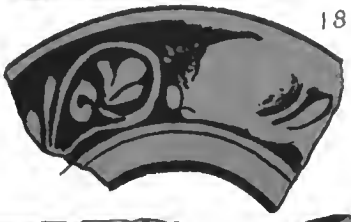
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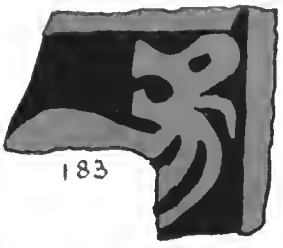
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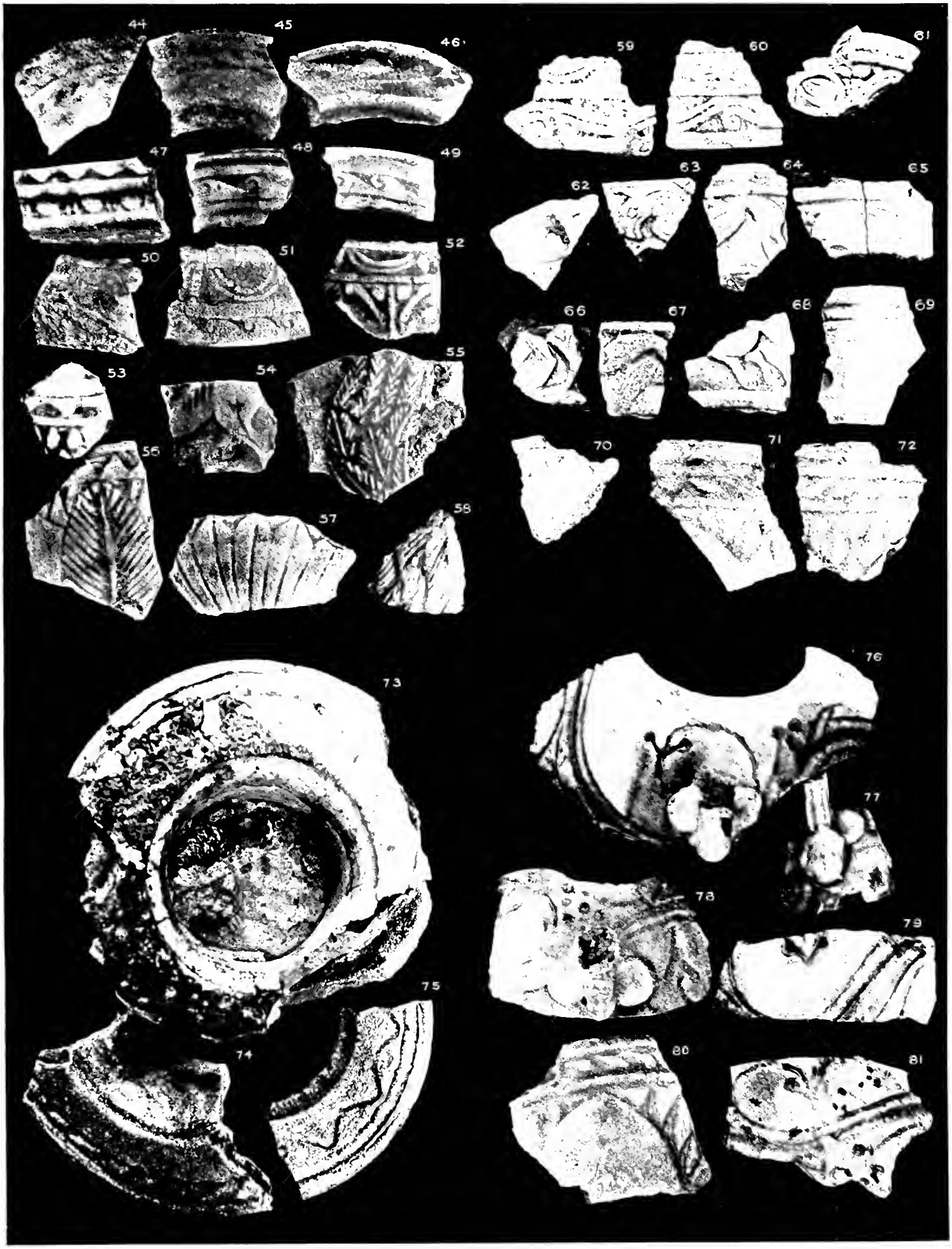
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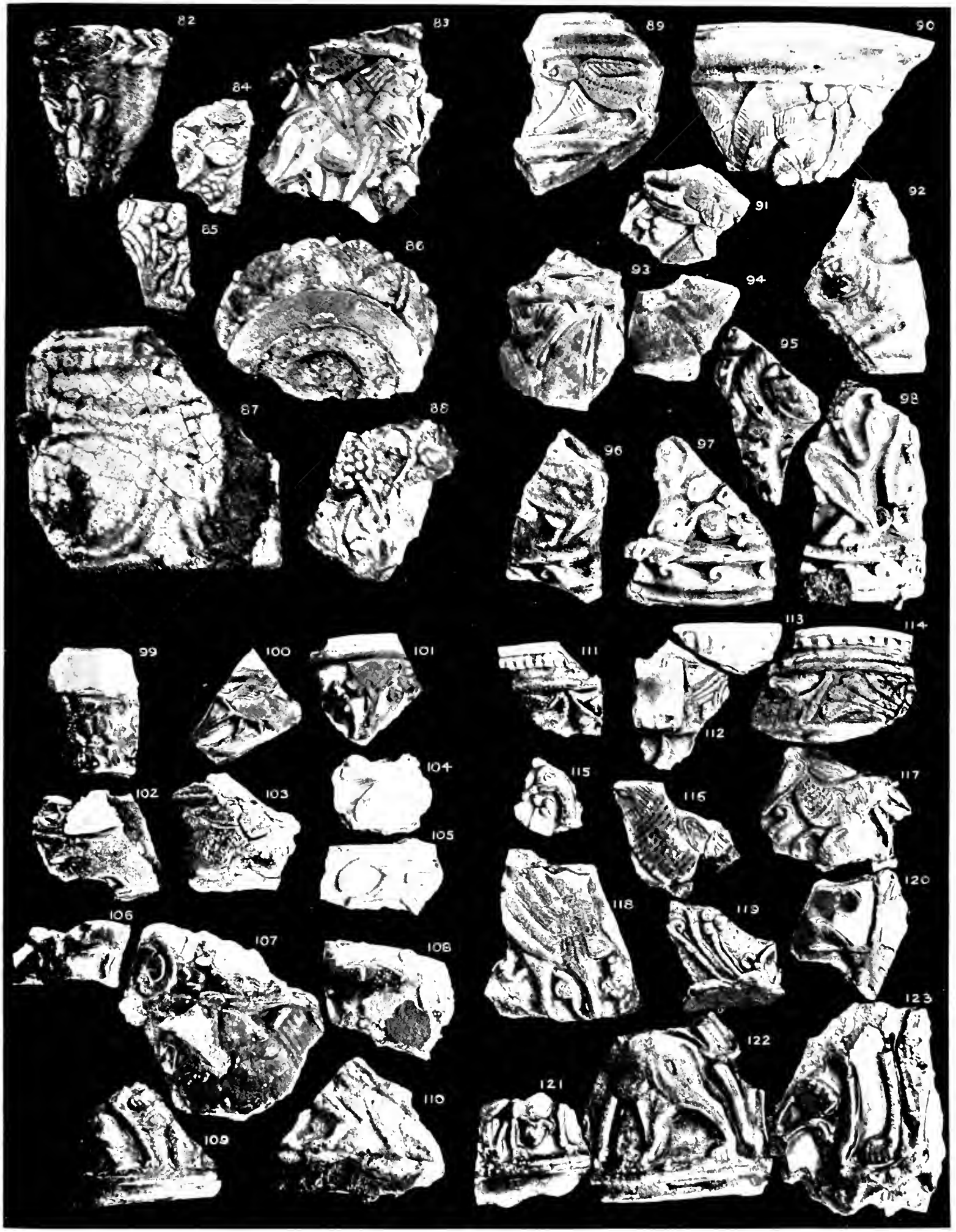
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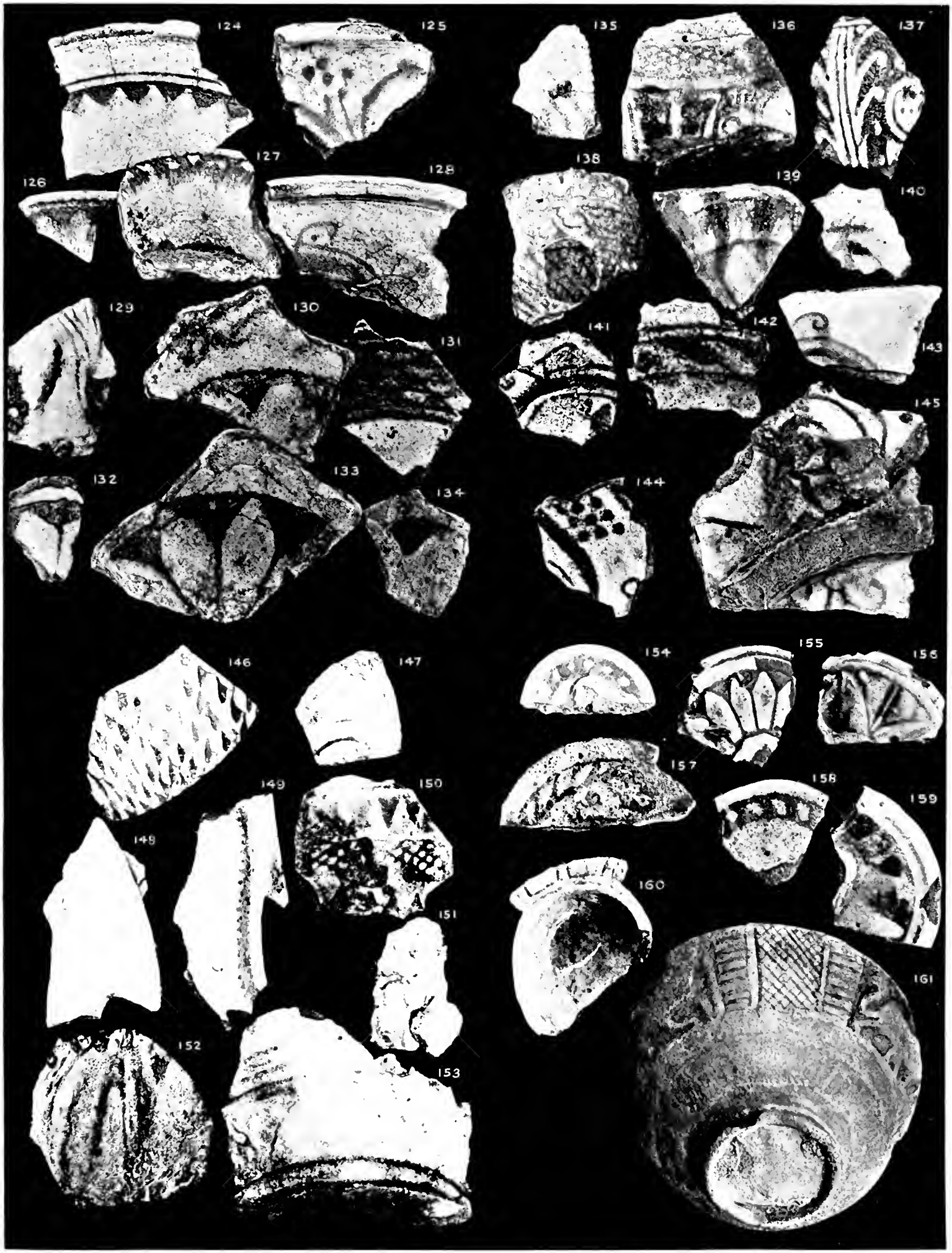
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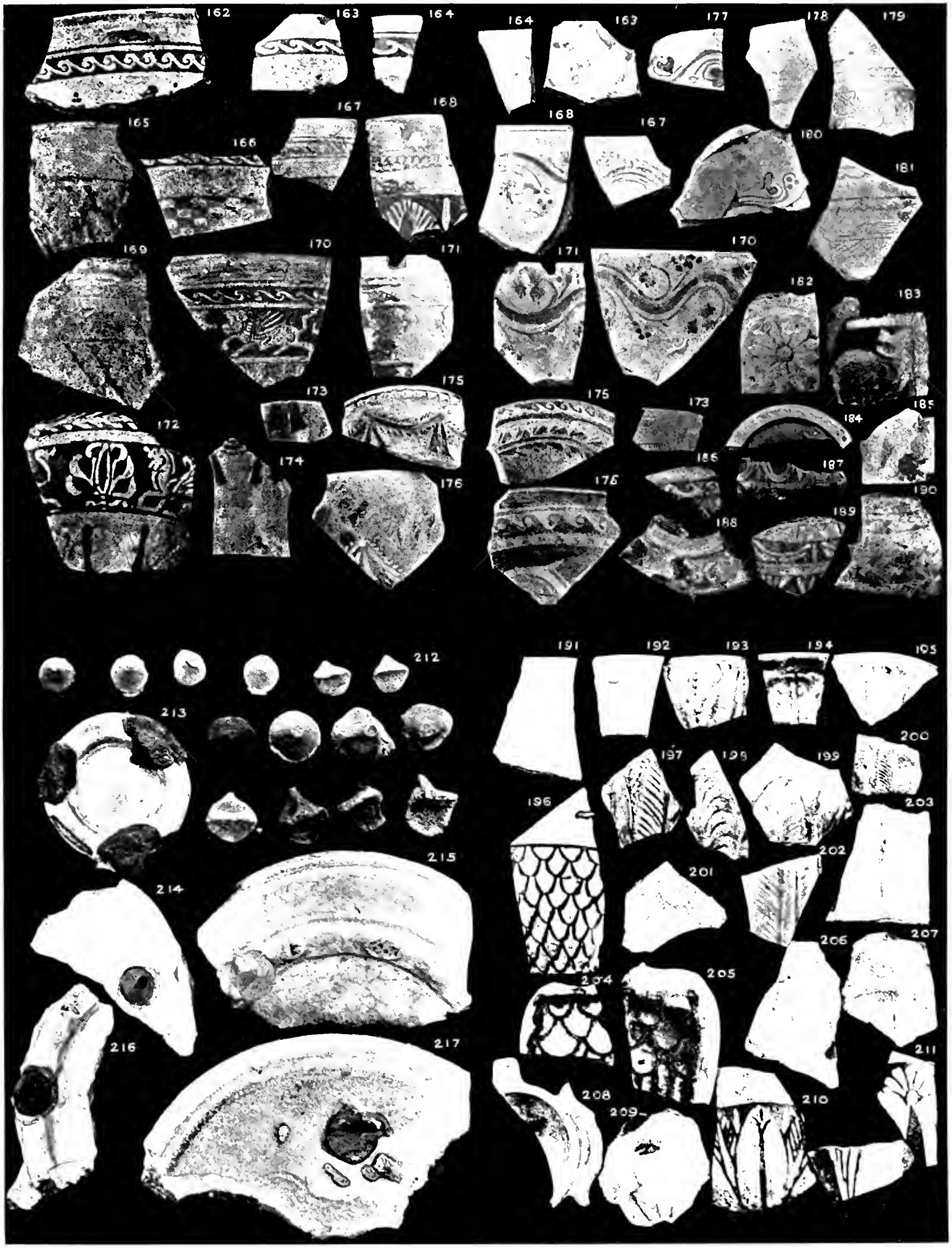
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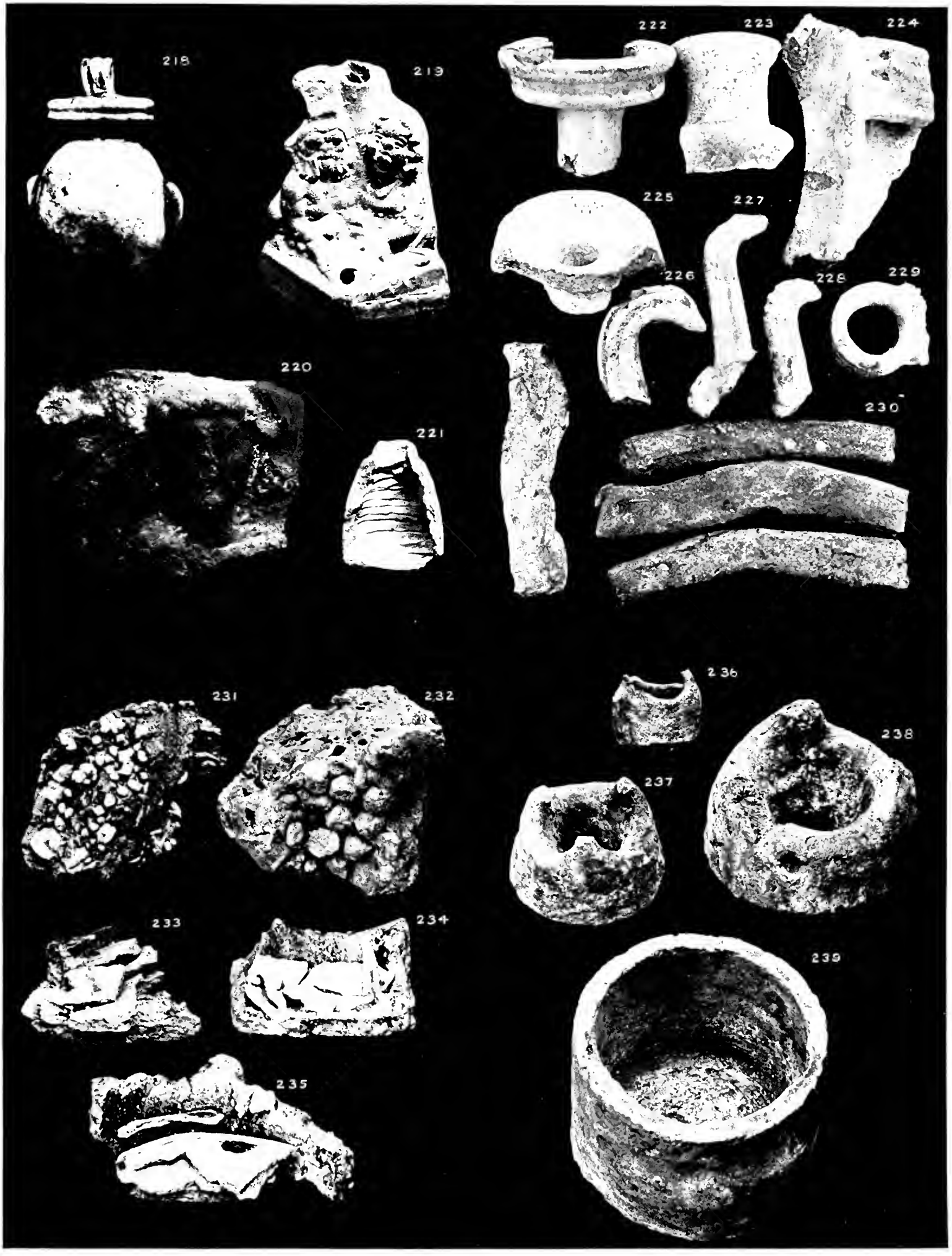
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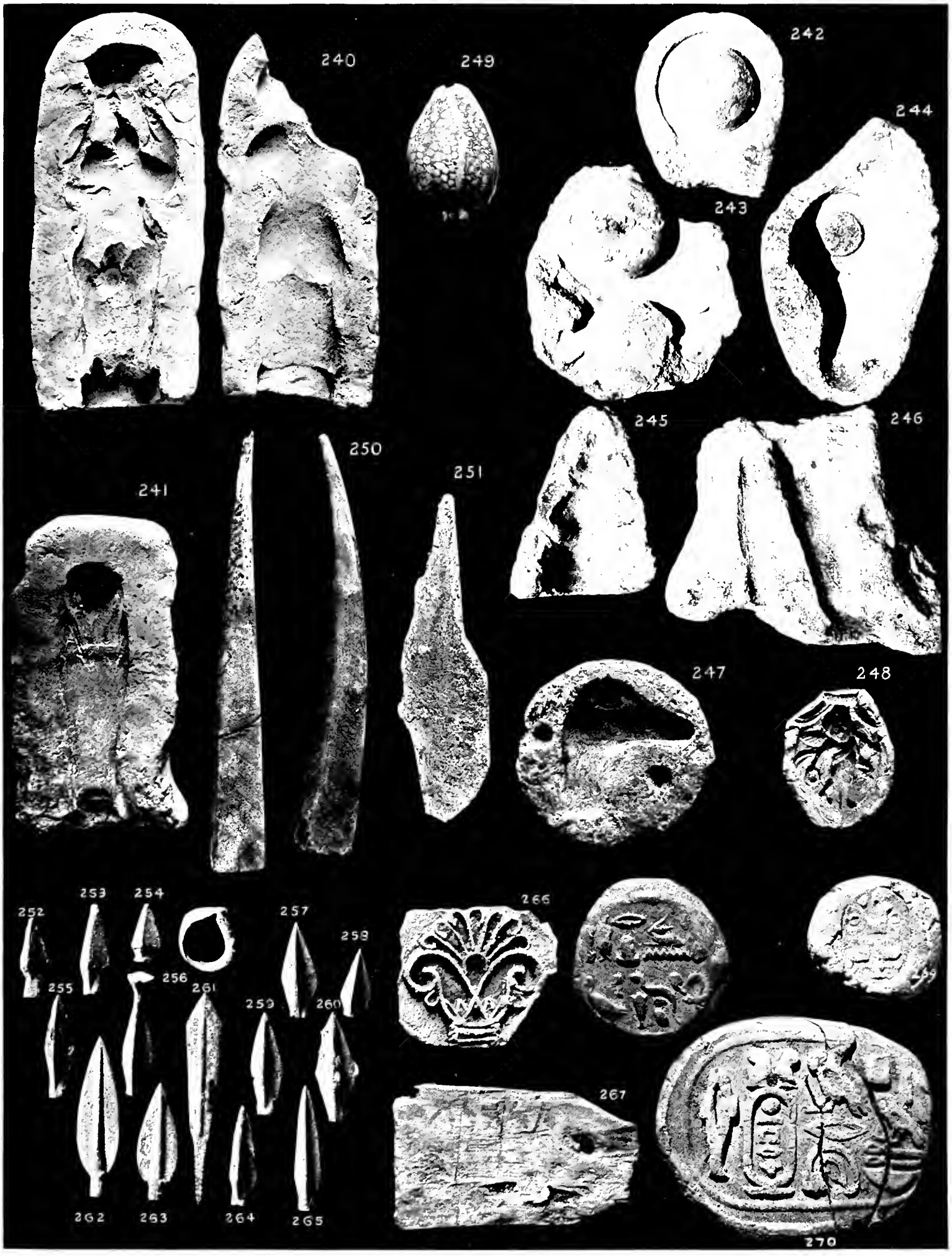
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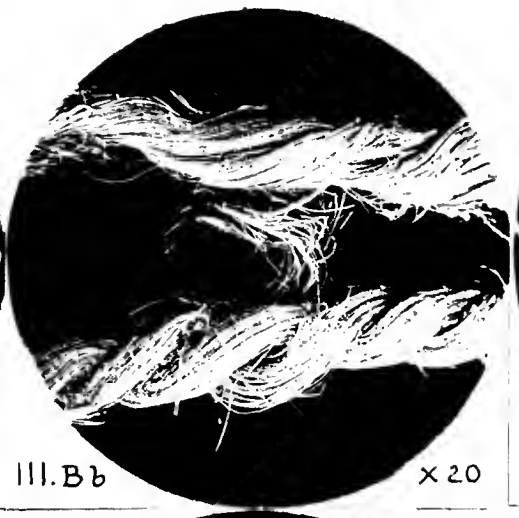

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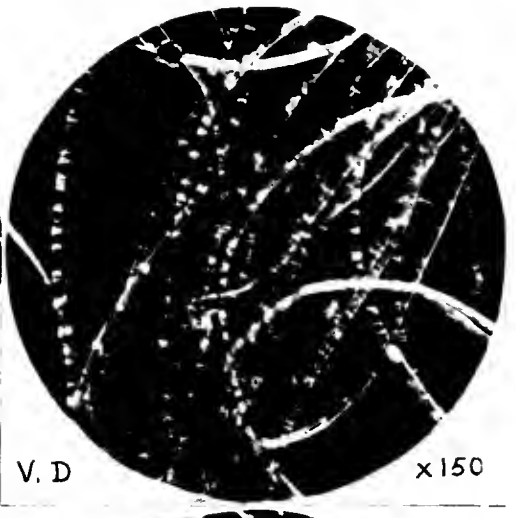

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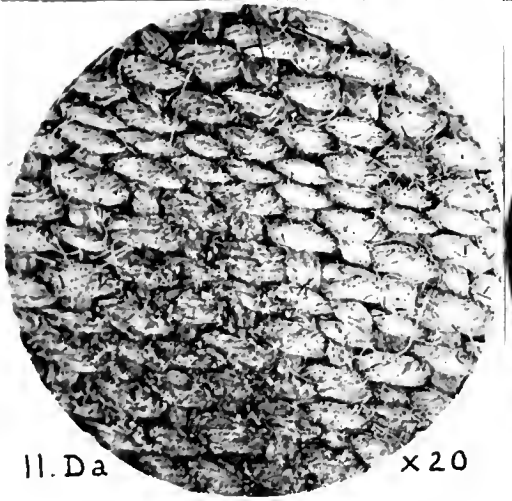

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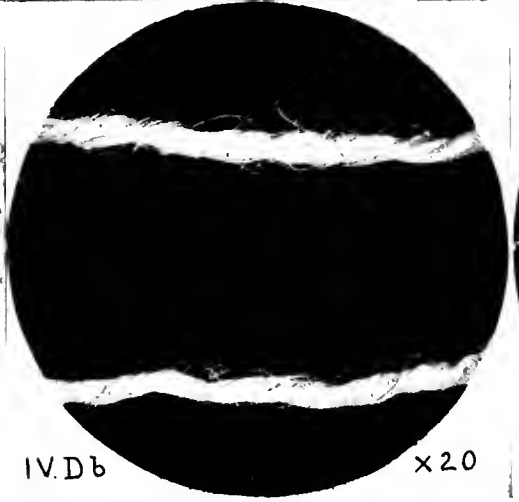

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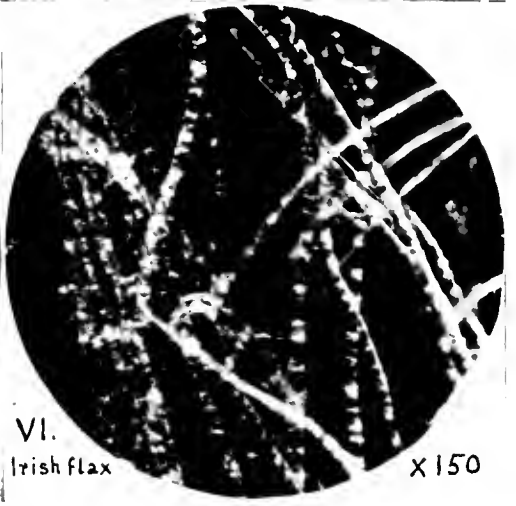

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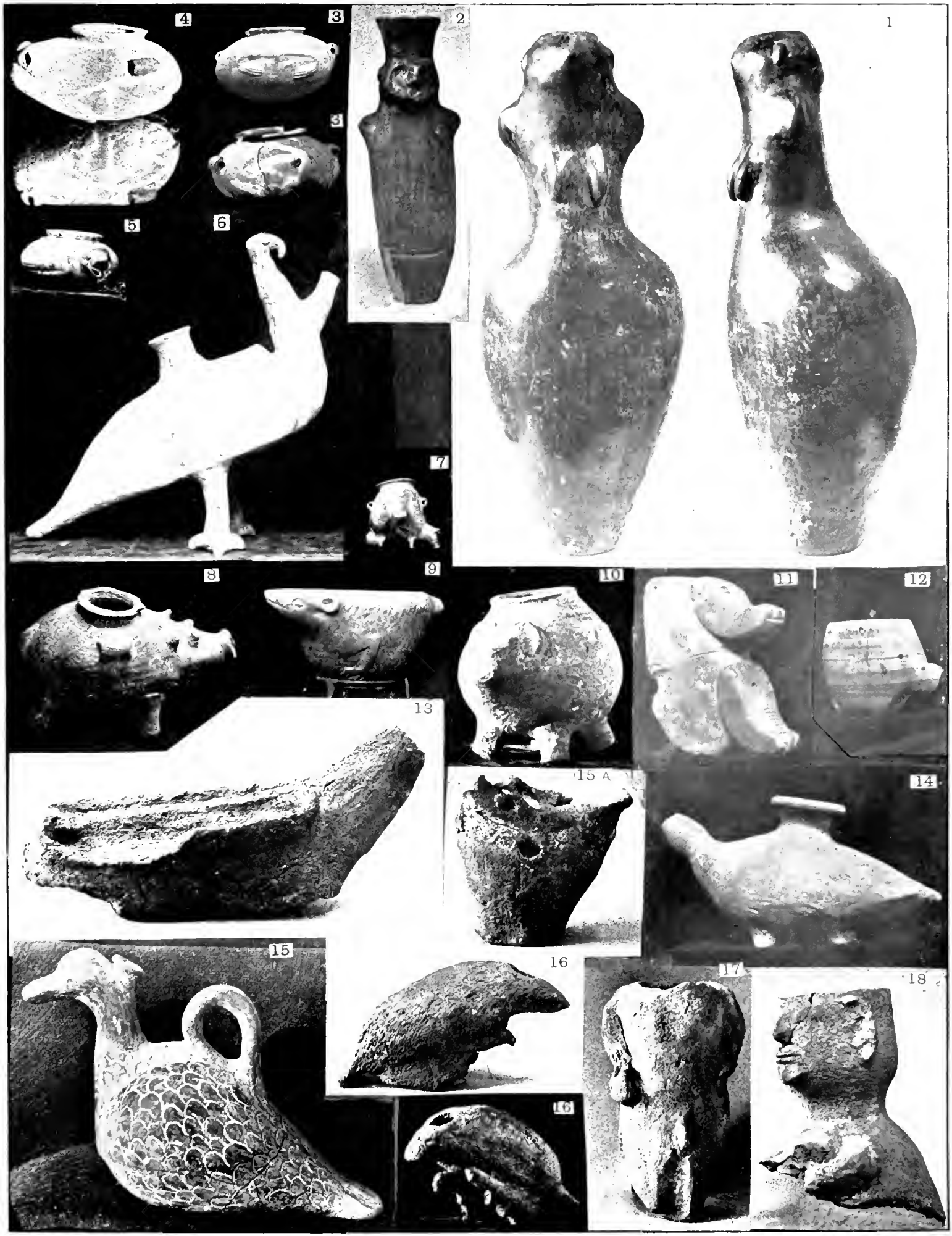
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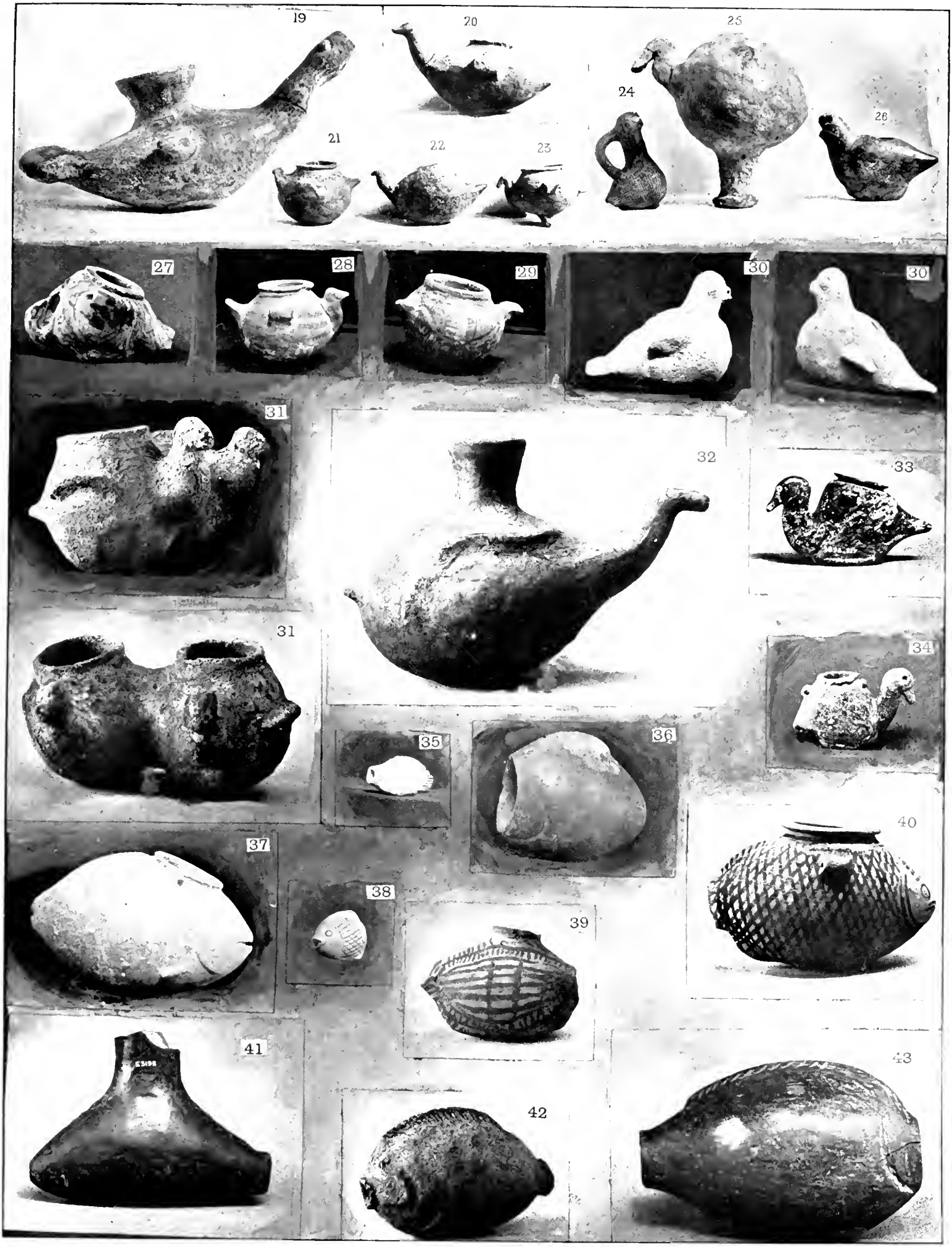
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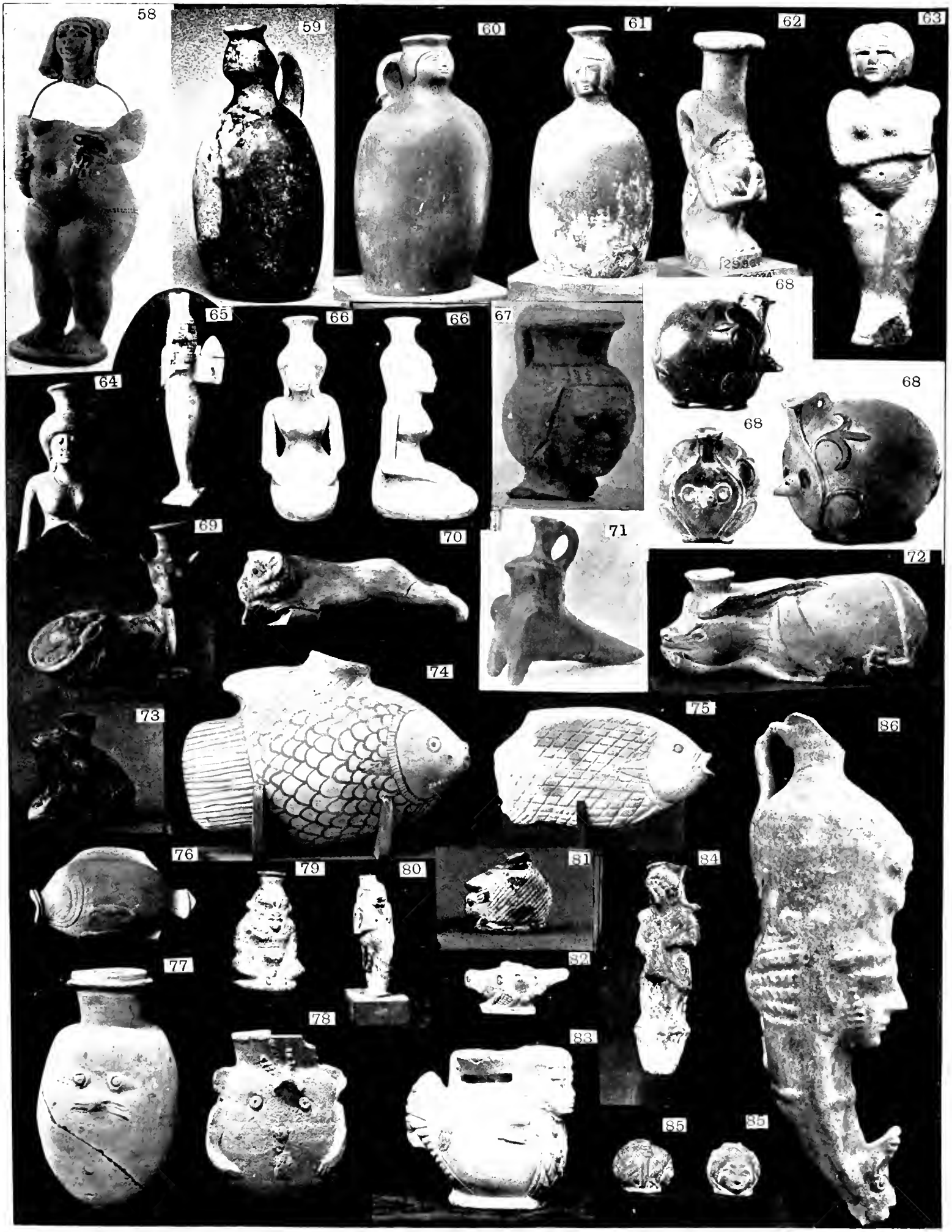
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